PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
US Department of Commerce
United States Patent and Trademark Office, PCT
2011 South Clark Place Room CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 08 November 2000 (08.11.00)	
International application No. PCT/US99/28528	**Applicant's or agent's file reference** 8887.3002PCT
International filing date (day/month/year) 02 December 1999 (02.12.99)	**Priority date** (day/month/year) 03 December 1998 (03.12.98)
Applicant ELDERING, Charles, A. et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

30 June 2000 (30.06.00)

[] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer J. Leitao
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To: DOUGLAS J. RYDER
300 NORTH BROAD STREET
DOYLESTOWN, PA 18901

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NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of Mailing *(day/month/year)* 05 JUN2001	
Applicant's or agent's file reference 8887.3002PCT	IMPORTANT NOTIFICATION

International application No.	International filing date *(day/month/year)*	Priority Date *(day/month/year)*
PCT/US99/28528	02 DECEMBER 1999	03 DECEMBER 1998

Applicant
TELECOM PARTNERS LTD.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer CHRISTOPHER GRANT Telephone No. (703) 305-4755

Form PCT/IPEA/416 (July 1992)*

18 Rec'd PCT/PTO 0 1 JUN 2001
09/857256

		DKT. NO. T702-15
INTERNATIONAL APPLICATION NO. PCT/US99/28528	INTERNATIONAL FILING DATE 02 DECEMBER 1999	PRIORITY DATE 03 DECEMBER 1998
APPLICANT EXPANSE NETWOIRKS, INC.		
TITLE SUBSCRIBER CHARACTERIZATION AND ADVERTISEMENT MONITORING SYSTEM		

CERTIFICATE OF MAILING (37 CFR 1.10)

EF096766343US
"Express Mail" mailing number

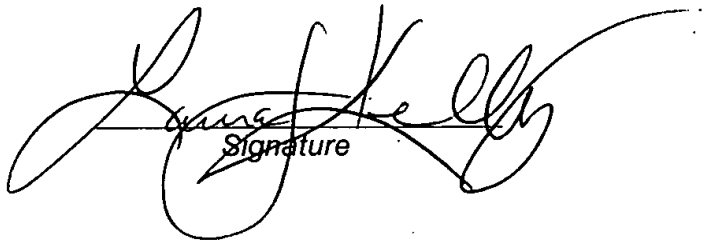
Date of Deposit

I hereby certify that the following *attached* paper or fee:

REQUEST FOR NATIONAL ENTRY OF PCT

is being deposited with the United States Postal Service on the date indicated above in an envelope as "Express Mail Post Office to Addressee" service under 37 CFR § 1.10 and is addressed to the Assistant Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Laura J. Kelly
(Name of person mailing application)



09/857256

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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

RECD 08 JUN 2001
WIPO PCT

Applicant's or agent's file reference 8887.3002PCT	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US99/28528	International filing date *(day/month/year)* 02 DECEMBER 1999	Priority date *(day/month/year)* 03 DECEMBER 1998
International Patent Classification (IPC) or national classification and IPC IPC(7): H04N 7/173 and US Cl.: 345/327; 348/1,7,9,12,13; 455/2,4.2, 5.1,6.2,6.3		
Applicant TELECOM PARTNERS LTD.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets.

 [X] This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 08 sheets.

3. This report contains indications relating to the following items:

 - I [X] Basis of the report
 - II [] Priority
 - III [] Non-establishment of report with regard to novelty, inventive step or industrial applicability
 - IV [] Lack of unity of invention
 - V [X] Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI [] Certain documents cited
 - VII [X] Certain defects in the international application
 - VIII [X] Certain observations on the international application

Date of submission of the demand	Date of completion of this report
30 JUNE 2000	20 MAY 2001
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer CHRISTOPHER GRANT Telephone No. (703) 305-4755

Form PCT/IPEA/409 (cover sheet) (July 1998)*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US99/28528

I. Basis of the report

1. With regard to the elements of the international application:*

☐ the international application as originally filed

☒ the description:
pages (See Attached) , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

☒ the claims:
pages (See Attached) , as originally filed
pages _____ , as amended (together with any statement) under Article 19
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

☒ the drawings:
pages (See Attached) , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

☒ the sequence listing part of the description:
pages (See Attached) , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the writen sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

☒ the description, pages none

☒ the claims, Nos. none

☒ the drawings, sheets/~~fig~~ none

5. ☐ This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

***Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US99/28528

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. statement

Novelty (N)	Claims	(Please See supplemental sheet)	YES
	Claims	(Please See supplemental sheet)	NO
Inventive Step (IS)	Claims	(Please See supplemental sheet)	YES
	Claims	(Please See supplemental sheet)	NO
Industrial Applicability (IA)	Claims	(Please See supplemental sheet)	YES
	Claims	(Please See supplemental sheet)	NO

2. citations and explanations (Rule 70.7)

Claims 2-4, 6-13, 16-29, 35-47, 52-55, 57-88, 90-105, 108, 109, 112-125, 127-135, 138, 139, 141-156, 158-165, 167 and 168 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest a data processing system for monitoring advertisements watched by a subscriber including descriptive fields and volume levels or product interests profile or context mining or subscriber profile vector; or a client-server based data processing system for monitoring advertisements watched by a subscriber comprising a first computer means at a client side for transmitting channel change requests, a second computer at a server side for receiving the channel change requests and for processing data in combination with the first-fourth means; or a system for generating subscriber profile vector or household demographic characteristics vector including heuristic rules and/or probablistic measurements as recited in the claims.

---------- NEW CITATIONS ----------
NONE

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claims 5, 30-32 and 48-51 are objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or contents thereof:

Claims 5, 30-32 and 48-51 are not present in the substitute claim pages provided by applicant on 20 April 2001.

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claims 23-24 and 38-43 are objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because the claims are indefinite for the following reason(s):

Two sets of claims 23-24 and 38-43 are presented on the substituted pages provided by applicant on 20 April 2001.

Claims 23 and 24 are presented on pages 50 and 48. It is note clear which set of claims 23 and 24 are to be examined.

Claims 38-43 are presented on pages 56-63 and again on pages 63-65. It is note clear which set of claims 38-43 are to be examined.

Claims 23 and 24 (page 50 version) are not dependent on a previous claim.

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

I. BASIS OF REPORT:

This report has been drawn on the basis of the description,
page(s) 1-38 , as originally filed.
page(s) none , filed with the demand.
and additional amendments:
NONE

This report has been drawn on the basis of the claims,
page(s) 39-52 , as originally filed.
page(s) none, as amended under Article 19.
page(s) 53-80, filed with the demand.
and additional amendments:
Pages 39-106, filed with the letter of 20 April 2001

This report has been drawn on the basis of the drawings,
page(s) 1-22, as originally filed.
page(s) none , filed with the demand.
and additional amendments:
NONE

This report has been drawn on the basis of the sequence listing part of the description:
page(s) NONE, as originally filed.
pages(s) NONE, filed with the demand.
and additional amendments:
NONE

V. 1. REASONED STATEMENTS:
The report as to Novelty was positive (YES) with respect to claims 2-4,6-13,16-29,35-47,52-55,57-88,90-105,108-109,112-125,127-135,138-139,141-156,158-165,167-168.
The report as to Novelty was negative (NO) with respect to claims NONE.
The report as to Inventive Step was positive (YES) with respect to claims 2-4,6-13,16-29,35-47,52-55,57-88,90-105,108-109,112-125,127-135,138-139,141-156,158-165,167-168.
The report as to Inventive Step was negative (NO) with respect to claims NONE.
The report as to Industrial Applicability was positive (YES) with respect to claims 2-4,6-13,16-29,35-47,52-55,57-88,90-105,108-109,112-125,127-135,138-139,141-156,158-165,167-168.
The report as to Industrial Applicability was negative (NO) with respect to claims NONE.

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Claims

What is claimed is:

2. A data processing system for monitoring advertisements watched by a subscriber, said data processing system comprising:

a storage medium;

means for monitoring subscriber activities, wherein the subscriber activities include volume levels;

means for storing the subscriber activities;

means for retrieving advertisement related information, wherein the advertisement related information contains descriptive fields corresponding to an advertisement;

means for determining the extent to which the advertisement is viewed by the subscriber; and

means for storing the descriptive fields and said determination of the extent to which the advertisement is viewed by the subscriber.

3. A data processing system for monitoring advertisements watched by a subscriber, said data processing system comprising:

means for monitoring subscriber activities;

means for storing the subscriber activities;

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means for retrieving advertisement related information, wherein the advertisement related information contains descriptive fields corresponding to an advertisement;

means for determining the extent to which the advertisement is viewed by the subscriber;

means for storing the descriptive fields and said determination of the extent to which the advertisement is viewed by the subscriber;

means for determining a subscriber product interests profile; and

means for storing said subscriber products interests profile.

4. A data processing system for monitoring advertisements watched by a subscriber, said data processing system comprising:

a storage medium;

means for monitoring subscriber activities;

means for storing the subscriber activities;

means for retrieving advertisement related information, wherein the advertisement related information contains descriptive fields corresponding to an advertisement and said means for retrieving advertisement related information

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comprises means for context mining of textual information associated with the advertisement;

means for determining the extent to which the advertisement is viewed by the subscriber; and

means for storing the descriptive fields and said determination of the extent to which the advertisement is viewed by the subscriber.

6. The system described in claim 5 wherein said textual information is text derived from closed-captioning data associated with said advertisement.

7. The system described in claim 6 wherein said text derived from closed-captioning data associated with said advertisement includes a product name field.

8. The system described in claim 5 wherein said text derived from closed-captioning data associated with said advertisement includes a product brand field.

9. A client-server based data processing system for monitoring advertisements watched by a subscriber, said client-server based data processing system comprising:

first computer processor means at a client side for receiving and displaying advertisements wherein said first computer means is capable of transmitting channel change requests;

second computer processor means at a server side for receiving said channel change requests and for processing data;

second storage means associated with second computer processor means for storing data on a storage medium;

first means at said server side for monitoring subscriber activity wherein said first means for monitoring subscriber activity includes receiving means for receiving subscriber channel change requests, recording means for storing subscriber channel change requests;

second means at said server side for retrieving advertisement related information wherein said advertisement related information contains descriptive fields corresponding to an advertisement;

third means at said server side for processing information wherein said third means includes means for determining the extent to which an advertisement is viewed by said subscriber; and

fourth means at said server side for storing said descriptive fields and said determination of the extent to which said advertisement is viewed by said subscriber.

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10. The system described in claim 9 further comprising:

fifth means for determining a subscriber product interests profile; and

sixth means for storing said subscriber product interests profile.

11. The system described in claim 9 wherein said second means for retrieving advertisement related information further comprises a means for context mining of textual information associated with said selected source material.

12. The system described in claim 11 wherein said textual information is text derived from closed-captioning data associated with said advertisement.

13. The system described in claim 12 wherein said text derived from closed-captioning data associated with said advertisement includes a product name field.

14. The system described in claim 12 wherein said text derived from closed-captioning data associated with said advertisement includes a product brand field.

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16. A data processing system for generating a subscriber profile vector, said data processing system comprising:

a storage medium;

means for monitoring subscriber activities including selected source material and volume levels, wherein the volume levels correspond to subscriber selection volume levels;

means for storing subscriber selection data, wherein the subscriber selection data corresponds to the selected source material;

means for retrieving source related information, wherein the source related information contains descriptive fields corresponding to the selected source material;

means for processing the subscriber selection data with respect to the descriptive fields to form the subscriber profile vector; and

means for storing the subscriber profile vector.

17. A data processing system for generating a subscriber profile vector, said data processing system comprising:

a storage medium;

means for monitoring subscriber activities including selected source material;

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means for storing subscriber selection data, wherein the subscriber selection data corresponds to the selected source material;

means for retrieving source related information, wherein the source related information contains descriptive fields corresponding to the selected source material;

means for processing the subscriber selection data with respect to the descriptive fields to form the subscriber profile vector, wherein the subscriber profile vector contains household demographic data indicating probabilistic measurements of household demographics; and

means for storing the subscriber profile vector.

18. A data processing system for generating a subscriber profile vector, said data processing system comprising:

a storage medium;

means for monitoring subscriber activities including selected source material;

means for storing subscriber selection data, wherein the subscriber selection data corresponds to the selected source material;

means for retrieving source related information, wherein the source related information contains descriptive fields corresponding to the selected source material;

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means for processing the subscriber selection data with respect to the descriptive fields to form the subscriber profile vector, wherein the subscriber profile vector contains household program preference information indicating probabilistic measurements of household program interests; and

means for storing the subscriber profile vector.

19. A data processing system for generating a subscriber profile vector, said data processing system comprising:

a storage medium;

means for monitoring subscriber activities including selected source material;

means for storing subscriber selection data, wherein the subscriber selection data corresponds to the selected source material;

means for retrieving source related information, wherein the source related information contains descriptive fields corresponding to the selected source material;

means for processing the subscriber selection data with respect to the descriptive fields to form the subscriber profile vector, wherein the subscriber profile vector contains household product preference information indicating probabilistic measurements of household product interests; and

means for storing the subscriber profile vector.

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20. A data processing system for generating a subscriber profile vector, said data processing system comprising:

a storage medium;

means for monitoring subscriber activities including selected source material;

means for storing subscriber selection data, wherein the subscriber selection data corresponds to the selected source material;

means for retrieving source related information, wherein the source related information contains descriptive fields corresponding to the selected source material and said means for retrieving source related information comprises means for context mining of textual information associated with the selected source material;

means for processing the subscriber selection data with respect to the descriptive fields to form the subscriber profile vector; and

means for storing the subscriber profile vector.

21. The system described in claim 19 wherein said textual information is text derived from closed-captioning data associated with said selected source material.

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22. The system described in claim 20, wherein the textual information is text derived from an electronic program guide.

23. A data processing system for generating a subscriber profile vector, said data processing system comprising:

a storage medium;

means for monitoring subscriber activities including selected source material;

means for storing subscriber selection data, wherein the subscriber selection data corresponds to the selected source material;

means for retrieving source related information, wherein the source related information contains descriptive fields corresponding to the selected source material;

means for processing the subscriber selection data over a viewing session with respect to the descriptive fields to form the subscriber profile vector, wherein the subscriber profile vector corresponds to the viewing session; and

means for storing the subscriber profile vector.

24. A data processing system for generating a subscriber profile vector, said data processing system comprising:

a storage medium;

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means for monitoring subscriber activities including selected source material;

means for storing subscriber selection data, wherein the subscriber selection data corresponds to the selected source material;

means for retrieving source related information, wherein the source related information contains descriptive fields corresponding to the selected source material;

means for processing the subscriber selection data over multiple viewing sessions with respect to the descriptive fields to form the subscriber profile vector, wherein the subscriber profile vector corresponds to an average value over the multiple viewing sessions; and

means for storing the subscriber profile vector.

25. A data processing system for generating a subscriber profile vector, said data processing system comprising:

(a) computer processor means for processing data;

(b) storage means for storing data on a storage medium;

(c) first means for monitoring subscriber activity wherein said first means includes recording means for storing subscriber selection data wherein said subscriber selection data corresponds to selected source material;

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(d) second means for retrieving source related information wherein said source related information contains descriptive fields corresponding to said selected source material;

(e) third means for generating a program characteristics vector based on said source related information;

(f) fourth means for storing a set of heuristic rules;

(g) fifth means for processing information wherein said fifth means includes means for processing said subscriber selection data with respect to said program characteristics vector and said set of heuristic rules to form said subscriber profile vector; and

(h) sixth means for storing said subscriber profile vector.

23. The system described in claim 25 wherein said first means for monitoring subscriber activity further comprises means for monitoring time durations wherein said time durations correspond to viewing times of said selected source material.

24. The system described in claim 25 wherein said first means for monitoring subscriber activity further comprises means for monitoring volume levels wherein said volume levels correspond to subscriber selection volume levels.

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25. The system described in claim 25 wherein said subscriber profile vector contains household demographic data indicating probabilistic measurements of household demographics.

26. The system described in claim 25 wherein said subscriber profile vector contains a household session interest profile indicating probabilistic measurements of household interests.

27. A data processing system for generating a household demographic characteristics vector, said data processing system comprising:

(a) computer processor means for processing data;

(b) storage means for storing data on a storage medium;

(c) first means for monitoring subscriber activity wherein said first means includes recording means for storing subscriber selection data wherein said subscriber selection data corresponds to selected source material;

(d) second means for generating household viewing habits information wherein said household viewing habits information is generated from said subscriber selection data;

(e) third means for storing a set of heuristic rules;

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(f) fourth means for processing information wherein said fourth means includes means for processing said subscriber selection data with respect to said set of heuristic rules to form said household demographic characteristics vector; and

(g) fifth means for storing said household demographic characteristics vector.

28. The system described in claim 27 wherein said fourth means for processing information processes information over a viewing session and wherein said household demographic characteristics vector corresponds to said viewing session.

29. The system described in claim 27 wherein said fourth means for processing information processes information over a period of multiple viewing sessions wherein said household demographic characteristics vector corresponds to an average value over said multiple viewing sessions.

35. A data processing system for generating a subscriber profile vector in a client-server based architecture, said data processing system comprising:

first computer processor means, at a client side, for requesting and displaying source information wherein said first

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computer means transmits a request for source material and receives and displays the source material;

second computer processor means, at a server side, for processing data;

storage means, associated with the second computer processor means, for storing data on a storage medium;

means, at said server side, for monitoring subscriber activity including

means for receiving subscriber requests for the source material,

means for monitoring volume levels wherein the volume levels correspond to subscriber selection volume levels, and

means for storing subscriber selection data wherein the subscriber selection data corresponds to a record of requests for the source material;

means, at said server side, for retrieving source related information wherein the source related information contains descriptive fields corresponding to the source material;

means, at said server side, for processing the subscriber selection data with respect to the descriptive fields to form the subscriber profile vector; and

means, at said server side, for storing the subscriber profile vector.

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36. A data processing system for generating a subscriber profile vector in a client-server based architecture, said data processing system comprising:

first computer processor means, at a client side, for requesting and displaying source information wherein said first computer means transmits a request for source material and receives and displays the source material;

second computer processor means, at a server side, for processing data;

storage means, associated with the second computer processor means, for storing data on a storage medium;

means, at said server side, for monitoring subscriber activity including

means for receiving subscriber requests for the source material, and

means for storing subscriber selection data wherein the subscriber selection data corresponds to a record of requests for the source material;

means, at said server side, for retrieving source related information wherein the source related information contains descriptive fields corresponding to the source material;

means, at said server side, for processing the subscriber selection data with respect to the descriptive fields to form the subscriber profile vector, wherein the subscriber profile

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vector contains household demographic data indicating probabilistic measurements of household demographics; and

means, at said server side, for storing the subscriber profile vector.

37. A data processing system for generating a subscriber profile vector in a client-server based architecture, said data processing system comprising:

first computer processor means, at a client side, for requesting and displaying source information wherein said first computer means transmits a request for source material and receives and displays the source material;

second computer processor means, at a server side, for processing data;

storage means, associated with the second computer processor means, for storing data on a storage medium;

means, at said server side, for monitoring subscriber activity including

means for receiving subscriber requests for the source material, and

means for storing subscriber selection data wherein the subscriber selection data corresponds to a record of requests for the source material;

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means, at said server side, for retrieving source related information wherein the source related information contains descriptive fields corresponding to the source material;

means, at said server side, for processing the subscriber selection data with respect to the descriptive fields to form the subscriber profile vector, wherein the subscriber profile vector contains household program preference information indicating probabilistic measurements of household program interests; and

means, at said server side, for storing the subscriber profile vector.

38. A data processing system for generating a subscriber profile vector in a client-server based architecture, said data processing system comprising:

first computer processor means, at a client side, for requesting and displaying source information wherein said first computer means transmits a request for source material and receives and displays the source material;

second computer processor means, at a server side, for processing data;

storage means, associated with the second computer processor means, for storing data on a storage medium;

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means, at said server side, for monitoring subscriber activity including

means for receiving subscriber requests for the source material, and

means for storing subscriber selection data wherein the subscriber selection data corresponds to a record of requests for the source material;

means, at said server side, for retrieving source related information wherein the source related information contains descriptive fields corresponding to the source material;

means, at said server side, for processing the subscriber selection data with respect to the descriptive fields to form the subscriber profile vector, wherein the subscriber profile vector contains household product preference information indicating probabilistic measurements of household product interests; and

means, at said server side, for storing the subscriber profile vector.

39. A data processing system for generating a subscriber profile vector in a client-server based architecture, said data processing system comprising:

first computer processor means, at a client side, for requesting and displaying source information wherein said first

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computer means transmits a request for source material and receives and displays the source material;

second computer processor means, at a server side, for processing data;

storage means, associated with the second computer processor means, for storing data on a storage medium;

means, at said server side, for monitoring subscriber activity including

means for receiving subscriber requests for the source material, and

means for storing subscriber selection data wherein the subscriber selection data corresponds to a record of requests for the source material;

means, at said server side, for retrieving source related information wherein the source related information contains descriptive fields corresponding to the source material, said means for retrieving comprises means for context mining of textual information associated with the selected source material;

means, at said server side, for processing the subscriber selection data with respect to the descriptive fields to form the subscriber profile vector, and

means, at said server side, for storing the subscriber profile vector.

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40. The system described in claim 34 wherein said textual information is text derived from closed-captioning data associated with said selected source material.

41. A data processing system for generating a subscriber profile vector in a client-server based architecture, said data processing system comprising:

first computer processor means, at a client side, for requesting and displaying source information wherein said first computer means transmits a request for source material and receives and displays the source material;

second computer processor means, at a server side, for processing data;

storage means, associated with the second computer processor means, for storing data on a storage medium;

means, at said server side, for monitoring subscriber activity including

means for receiving subscriber requests for the source material, and

means for storing subscriber selection data wherein the subscriber selection data corresponds to a record of requests for the source material;

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means, at said server side, for retrieving source related information wherein the source related information contains descriptive fields corresponding to the source material, said means for retrieving comprises means for retrieving information associated with the selected source material from an electronic program guide;

means, at said server side, for processing the subscriber selection data with respect to the descriptive fields to form the subscriber profile vector, and

means, at said server side, for storing the subscriber profile vector.

42. A data processing system for generating a subscriber profile vector in a client-server based architecture, said data processing system comprising:

first computer processor means, at a client side, for requesting and displaying source information wherein said first computer means transmits a request for source material and receives and displays the source material;

second computer processor means, at a server side, for processing data;

storage means, associated with the second computer processor means, for storing data on a storage medium;

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means, at said server side, for monitoring subscriber activity including

means for receiving subscriber requests for the source material, and

means for storing subscriber selection data wherein the subscriber selection data corresponds to a record of requests for the source material;

means, at said server side, for retrieving source related information wherein the source related information contains descriptive fields corresponding to the source material;

means, at said server side, for processing the subscriber selection data over a viewing session with respect to the descriptive fields, to form the subscriber profile, wherein the subscriber profile vector corresponds to the viewing session; and

means, at said server side, for storing the subscriber profile vector.

43. A data processing system for generating a subscriber profile vector in a client-server based architecture, said data processing system comprising:

first computer processor means, at a client side, for requesting and displaying source information wherein said first

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computer means transmits a request for source material and receives and displays the source material;

second computer processor means, at a server side, for processing data;

storage means, associated with the second computer processor means, for storing data on a storage medium;

means, at said server side, for monitoring subscriber activity including

means for receiving subscriber requests for the source material, and

means for storing subscriber selection data wherein the subscriber selection data corresponds to a record of requests for the source material;

means, at said server side, for retrieving source related information wherein the source related information contains descriptive fields corresponding to the source material;

means, at said server side, for processing the subscriber selection data over multiple viewing sessions with respect to the descriptive fields to form the subscriber profile, wherein the subscriber profile vector corresponds to an average value over the multiple viewing sessions; and

means, at said server side, for storing the subscriber profile vector.

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38. The system described in claim 33 wherein said third means for processing information processes information over a viewing session and wherein said subscriber profile vector corresponds to said viewing session.

39. The system described in claim 33 wherein said third means for processing information processes information over multiple viewing sessions and wherein said subscriber profile vector corresponds to an average value over said multiple viewing sessions.

40. A data processing system for generating a subscriber profile vector in a client-server based architecture, said data processing system comprising:

(a) first computer processor means at a client side for requesting and displaying source information wherein said first computer means transmits a request for source material and receives and displays said source material;

(b) second computer processor means at a server side for processing data;

(c) second storage means associated with second computer processor means for storing data on a storage medium;

(d) first means at said server side for monitoring subscriber activity wherein said first means for monitoring

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subscriber activity includes receiving means for receiving subscriber requests for said source material, recording means for storing subscriber selection data wherein said subscriber selection data corresponds to a record of requests for said source material;

(e) second means at said server side for retrieving source related information wherein said source related information contains descriptive fields corresponding to said source material;

(f) third means at said server side for generating a program characteristics vector based on said source related information;

(g) fourth means at said server side for storing a set of heuristic rules;

(h) fifth means at said server side for processing information wherein said fifth means includes means for processing said subscriber selection data with respect to said program characteristics vector and said set of heuristic rules to form said subscriber profile vector; and

(i) sixth means at said server side for storing said subscriber profile vector.

41. The system described in claim 40 wherein said first means for monitoring subscriber activity further comprises

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means for monitoring time durations wherein said time durations correspond to viewing times of said selected source material.

42. The system described in claim 40 wherein said first means for monitoring subscriber activity further comprises means for monitoring volume levels wherein said volume levels correspond to subscriber selection volume levels.

43. The system described in claim 40 wherein said subscriber profile vector contains household demographic data indicating probabilistic measurements of household demographics.

44. The system described in claim 40 wherein said subscriber profile vector contains a household session interest profile indicating probabilistic measurements of household interests.

45. A data processing system for generating a household demographic characteristics vector in a client-server based architecture, said data processing system comprising:

(a) first computer processor means at a client side for requesting and displaying source information wherein said first

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computer means transmits a request for source material and receives and displays said source material;

(b) second computer processor means at a server side for processing data;

(c) first means at said server side for monitoring subscriber activity wherein said first means includes recording means for storing subscriber selection data wherein said subscriber selection data corresponds to selected source material;

(d) second means at said client side for generating household viewing habits information wherein said household viewing habits information is generated from said subscriber selection data;

(e) third means at said server side for storing a set of heuristic rules;

(f) fourth means at said server side for processing information wherein said fourth means includes means for processing said subscriber selection data with respect to said set of heuristic rules to form said household demographic characteristics vector; and

(g) fifth means at said server side for storing said household demographic characteristics vector.

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46. The system described in claim 45 wherein said fourth means for processing information processes information over a viewing session and wherein said household demographic characteristics vector corresponds to said viewing session.

47. The system described in claim 45 wherein said fourth means for processing information processes information over a period of multiple viewing sessions wherein said household demographic characteristics vector corresponds to an average value over said multiple viewing sessions.

52. A method for generating a subscriber profile for a subscribed user of television programming, the method comprising:

monitoring user viewing activities including channel change signals;

collecting subscriber selection data based on source material selected by the user over a predetermined period of time; and

processing the subscriber selection data to create a subscriber profile.

53. The method of claim 52, wherein the source material includes analog video, Motion Picture Expert Group, digital

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video, Hypertext MarkUp Language material, and other multimedia source material supplied to the user by a provider of the television programming.

54. A method for generating a subscriber profile for a subscribed user of television programming, the method comprising:

monitoring user viewing activities including volume control commands initiated by the user;

collecting subscriber selection data based on source material selected by the user over a predetermined period of time; and

processing the subscriber selection data to create a subscriber profile.

55. The method of claim 54, wherein said monitoring user viewing activities includes monitoring program selection commands initiated by the user.

57. A method for generating a subscriber profile for a subscribed user of television programming, the method comprising:

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monitoring user viewing activities including address requests made by the user requesting delivery of programming from the provider of the television programming;

collecting subscriber selection data based on source material selected by the user over a predetermined period of time; and

processing the subscriber selection data to create a subscriber profile.

58. A method for generating a subscriber profile for a subscribed user of television programming, the method comprising:

monitoring user viewing activities including record signals initiated by the user;

collecting subscriber selection data based on source material selected by the user over a predetermined period of time; and

processing the subscriber selection data to create a subscriber profile.

59. The method of claim 52, wherein said collecting subscriber selection data includes extracting source related text from the source material.

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60. The method of claim 59, wherein the source related text includes one or more descriptive fields.

61. The method of claim 59, wherein the source material is an electronic program guide and the source related text is extracted from the electronic program guide.

62. The method of claim 59, wherein the source material is at least one HTML file related to the source material and the source related text is extracted from the at least one HTML file.

63. The method of claim 59, wherein the source material includes close captioning information and the source related text is extracted from the close captioning information.

64. The method of claim 52, wherein said monitoring includes monitoring time durations, wherein the time durations correspond to viewing times of selected source material.

65. A method for generating a subscriber profile for a subscribed user of television programming, the method comprising:

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monitoring user viewing activities;

collecting subscriber selection data based on source material selected by the user over a predetermined period of time; and

processing the subscriber selection data to create a subscriber profile, wherein said processing the subscriber selection data includes generating one or more program characteristics vectors based on the subscriber selection data.

66. The method of claim 65, wherein the program characteristics vectors include one or more values characterizing the source material.

67. A method for generating a subscriber profile for a subscribed user of television programming, the method comprising:

monitoring user viewing activities;

collecting subscriber selection data based on source material selected by the user over a predetermined period of time; and

processing the subscriber selection data to create a subscriber profile, wherein said processing the subscriber selection data includes generating a n-dimensional program

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characteristics matrix comprising one or more program characteristics vectors.

68. A method for generating a subscriber profile for a subscribed user of television programming, the method comprising:

monitoring user viewing activities;

collecting subscriber selection data based on source material selected by the user over a predetermined period of time; and

processing the subscriber selection data to create a subscriber profile, wherein said processing the subscriber selection data includes processing subscriber selection data based on a pre-determined set of heuristic rules.

69. The method of claim 68, wherein the heuristic rules include logical forms.

70. The method of claim 68, wherein the heuristic rules include conditional probabilities.

71. The method of claim 52, wherein the subscriber profile is based on the users interests.

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72. A method for generating a subscriber profile for a subscribed user of television programming, the method comprising:

monitoring user viewing activities;

collecting subscriber selection data based on source material selected by the user over a predetermined period of time; and

processing the subscriber selection data to create a subscriber profile, wherein the user belongs to a household and the subscriber profile is based on the interests of the household.

73. A method for generating a subscriber profile for a subscribed user of television programming, the method comprising:

monitoring user viewing activities;

collecting subscriber selection data based on source material selected by the user over a predetermined period of time; and

processing the subscriber selection data to create a subscriber profile, wherein the subscriber profile is a demographic profile indicating the probable age, income, gender, and other demographics of the user.

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74. The method of claim 73, wherein the predetermined period of time for collecting subscriber selection data is a viewing session, and the demographic profile is for the user during the viewing session.

75. The method of claim 73, wherein the predetermined period of time for collecting subscriber selection data is a plurality of viewing sessions, and the demographic profile is an average demographic profile for the user, wherein the average demographic profile is an average for the plurality of viewing sessions.

76. A method for generating a subscriber profile for a subscribed user of television programming, the method comprising:

monitoring user viewing activities;

collecting subscriber selection data based on source material selected by the user over a predetermined period of time; and

processing the subscriber selection data to create a subscriber profile, wherein the subscriber profile is a program preference profile indicating the type of programming of interest to the user.

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77. A method for generating a subscriber profile for a subscribed user of television programming, the method comprising:

monitoring user viewing activities;

collecting subscriber selection data based on source material selected by the user over a predetermined period of time; and

processing the subscriber selection data to create a subscriber profile, wherein the subscriber profile is a product preference profile for the user.

78. The method of claim 73, wherein the user belongs to a household and the subscriber profile includes probabilistic measurements of household demographics.

79. The method of claim 76, wherein the user belongs to a household and the subscriber profile includes probabilistic measurements of household program interests.

80. The method of claim 77, wherein the user belongs to a household and the subscriber profile includes probabilistic measurements of household product interests.

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81. The method of claim 52, wherein the subscriber belongs to a household, the predetermined period of time for collecting subscriber selection data is a viewing session, and the subscriber profile is a demographic profile for the household during the viewing session.

82. The method of claim 52, wherein the subscriber belongs to a household, the predetermined period of time for collecting subscriber selection data is a plurality of viewing sessions, and the subscriber profile is an average demographic profile for the household, wherein the average demographic profile is an average for the plurality of viewing sessions.

83. The method of claim 52, wherein the subscriber profile is controlled by the user.

84. The method of claim 52, wherein the subscriber profile is analyzed by a third party for the purposes of marketing and advertising.

85. The method of claim 52, wherein access to the subscriber profile is limited to a select number of other parties.

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86. The method of claim 52, further comprising analyzing the subscriber profile to estimate user viewing habits.

87. A data processing system for generating a subscriber profile for a subscribed user of television programming, the data processing system comprising:

means for processing data;

a storage medium;

means for monitoring subscriber activity including

means for storing subscriber selection data, wherein the subscriber selection data corresponds to source material selected by a subscriber, and

means for monitoring volume control commands initiated by the subscriber;

means for retrieving source related information which includes descriptive fields corresponding to the selected source material;

means for processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile; and

means for storing the subscriber profile.

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88. The system described in claim 87, wherein the means for monitoring subscriber activity further includes means for monitoring viewing times of the selected source material.

90. A data processing system for generating a subscriber profile for a subscribed user of television programming, the data processing system comprising:

means for storing subscriber selection data, wherein the subscriber selection data corresponds to source material selected by a subscriber;

means for retrieving source related information which includes descriptive fields corresponding to the selected source material;

means for processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile; and

means for storing the subscriber profile, wherein the subscriber profile includes probabilistic measurements of household demographics.

91. A data processing system for generating a subscriber profile for a subscribed user of television programming, the data processing system comprising:

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means for storing subscriber selection data, wherein the subscriber selection data corresponds to source material selected by a subscriber;

means for retrieving source related information which includes descriptive fields corresponding to the selected source material;

means for processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile; and

means for storing the subscriber profile, wherein the subscriber profile includes probabilistic measurements of household program interests.

92. A data processing system for generating a subscriber profile for a subscribed user of television programming, the data processing system comprising:

means for storing subscriber selection data, wherein the subscriber selection data corresponds to source material selected by a subscriber;

means for retrieving source related information which includes descriptive fields corresponding to the selected source material;

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means for processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile; and

means for storing the subscriber profile, wherein the subscriber profile includes probabilistic measurements of household product interests.

93. The system described in claim 87, wherein the means for retrieving source related information includes means for context mining of textual information associated with the selected source material.

94. The system described in claim 93, wherein the textual information is text derived from closed-captioning data.

95. The system described in claim 87, wherein the means for retrieving source related information includes means for retrieving information associated with the selected source material from an electronic program guide.

96. A data processing system for generating a subscriber profile for a subscribed user of television programming, the data processing system comprising:

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means for storing subscriber selection data, wherein the subscriber selection data corresponds to source material selected by a subscriber;

means for retrieving source related information which includes descriptive fields corresponding to the selected source material;

means for processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile, wherein the means for processing the subscriber selection data processes the data over a viewing session so that the subscriber profile corresponds to the viewing session; and

means for storing the subscriber profile.

97. A data processing system for generating a subscriber profile for a subscribed user of television programming, the data processing system comprising:

means for storing subscriber selection data, wherein the subscriber selection data corresponds to source material selected by a subscriber;

means for retrieving source related information which includes descriptive fields corresponding to the selected source material;

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means for processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile, wherein the means for processing the subscriber selection data includes processing the subscriber selection data over multiple viewing sessions to generate an average subscriber profile which is an average of the subscriber profiles for each viewing session; and

means for storing the subscriber profile.

98. A data processing system for generating a subscriber profile vector for a subscribed user of television programming, the data processing system comprising:

means for processing data;

a storage medium;

means for monitoring subscriber activity including means for storing subscriber selection data, wherein the subscriber selection data corresponds to source material selected by the user;

means for retrieving source related information including descriptive fields corresponding to the selected source material;

means for generating a program characteristics vector based on the source related information;

means for storing a set of heuristic rules;

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means for processing the subscriber selection data with respect to the program characteristics vector and the set of heuristic rules to generate the subscriber profile vector; and

means for storing the subscriber profile vector.

99. The system described in claim 98, wherein the means for monitoring subscriber activity further includes means for monitoring viewing times of the selected source material.

100. The system described in claim 98, wherein the means for monitoring subscriber activity further includes means for monitoring subscriber selection volume levels.

101. The system described in claim 98, wherein the subscriber profile vector includes probabilistic measurements of household demographics.

102. The system described in claim 98, wherein the subscriber profile includes probabilistic measurements of household interests.

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103. A data processing system for generating a household demographic characteristics vector, the data processing system comprising:

means for processing data;

a storage medium;

means for monitoring subscriber activity including means for storing subscriber selection data, wherein the subscriber selection data corresponds to selected source material;

means for generating household viewing habits from the subscriber selection data;

means for storing a set of heuristic rules;

means for processing the subscriber selection data with respect to the set of heuristic rules to generate the household demographic characteristics vector; and

means for storing the household demographic characteristics vector.

104. The system described in claim 103, wherein the means for processing the subscriber selection data includes processing information over a viewing session, and the household demographic characteristics vector corresponds to the viewing session.

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105. The system described in claim 103, wherein the means for processing the subscriber selection data includes processing the subscriber selection data over multiple viewing sessions to generate an average household demographic characteristics vector which is an average of the household demographic characteristic vectors for each viewing session.

108. An interactive television system comprising

an input device for allowing a subscriber to select source material to view;

a monitor for displaying the selected source material; and

a profile generator for generating a profile of the subscriber based on source material viewed, wherein the profile generator includes:

means for monitoring subscriber activity;

means for retrieving source related information corresponding to the selected source material;

means for generating a content characteristics vector based on the source related information; and

means for generating a subscriber profile based on the subscriber activity, the content characteristics vector, and a set of heuristic rules.

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109. An interactive television system comprising:

a input device for allowing a subscriber to select source material to view;

a monitor for displaying the selected source material; and

a profile generator for generating a profile of the subscriber based on source material viewed, wherein the profile generator includes:

means for monitoring subscriber activity;

means for generating a viewing habits profile from the subscriber activity; and

means for generating a subscriber profile based on the viewing habits profile and a set of heuristic rules.

112. A method for monitoring advertisements watched by a subscriber, the method comprising:

monitoring subscriber advertising viewing activities;

retrieving advertising related information including descriptive fields corresponding to an advertisement;

determining the extent to which the advertisement is viewed by the subscriber;

recording the determination; and

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generating a subscriber profile based on at least one recorded determination, wherein the subscriber profile is a subscriber product interests profile.

113. A method for monitoring advertisements watched by a subscriber, the method comprising:

monitoring subscriber advertising viewing activities including volume control commands initiated by the subscriber;

retrieving advertising related information including descriptive fields corresponding to an advertisement;

determining the extent to which the advertisement is viewed by the subscriber; and

recording the determination.

114. A method for monitoring advertisements watched by a subscriber, the method comprising:

monitoring subscriber advertising viewing activities including channel change signals initiated by the subscriber;

retrieving advertising related information including descriptive fields corresponding to an advertisement;

determining the extent to which the advertisement is viewed by the subscriber; and

recording the determination.

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115. The method of claim 114, wherein said retrieving advertising related information includes extracting source related text from source material for the advertisement.

116. The method of claim 115, wherein the source related text includes at least one descriptive field.

117. The method of claim 115, wherein the source related text is extracted from an electronic program guide.

118. A method for monitoring advertisements watched by a subscriber, the method comprising:

monitoring subscriber advertising viewing activities;

retrieving advertising related information including descriptive fields corresponding to an advertisement, wherein said retrieving advertising related information includes extracting source related text from source material for the advertisement, and the source related text is extracted from at least one HTML file related to the source material;

determining the extent to which the advertisement is viewed by the subscriber;

recording the determination.

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119. The method of claim 115, wherein the source related text is extracted from the closed-captioning information.

120. The method of claim 115, wherein the source related text extracted from source material includes a product name field.

121. The method of claim 115, wherein the source related text extracted from source material includes a product brand field.

122. The method of claim 115, further comprising generating at least one advertising characteristic based on the extracted source related text.

123. The method of claim 115, further comprising generating at least one advertising characteristic based on at least one value characterizing the source material

124. The method of claim 122, wherein the at least one advertising characteristic includes an n-dimensional characteristics matrix.

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125. A data processing system for monitoring advertisements watched by a subscriber, the data processing system comprising:

means for monitoring subscriber activity including subscriber selection volume levels;

means for storing subscriber selections;

means for retrieving advertisement related information including descriptive fields corresponding to an advertisement;

means for processing information including means for determining the extent to which an advertisement is viewed by the subscriber; and

means for storing the descriptive fields and the determination of the extent to which the advertisement is viewed by the subscriber.

127. A data processing system for monitoring advertisements watched by a subscriber, the data processing system comprising:

means for monitoring subscriber activity;

means for storing subscriber selections;

means for retrieving advertisement related information including descriptive fields corresponding to an advertisement;

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means for processing information including means for determining the extent to which an advertisement is viewed by the subscriber;

means for storing the descriptive fields and the determination of the extent to which the advertisement is viewed by the subscriber;

means for determining a subscriber product interests profile; and

means for storing the subscriber product interests profile.

128. The system described in claim 125, wherein the means for retrieving advertisement related information includes means for context mining of textual information associated with source material of the advertisement.

129. The system described in claim 128, wherein the textual information is text derived from closed-captioning data.

130. The system described in claim 128, wherein the textual information includes a product name field.

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131. The system described in claim 128, wherein the textual information includes a product brand field.

132. A client-server based data processing system for monitoring advertisements watched by a subscriber, the client-server based data processing system comprising:

means for transmitting subscriber channel change requests;

means for monitoring subscriber activity including:

means for receiving subscriber channel change requests;

means for storing the subscriber channel change requests;

means for retrieving advertisement related information, wherein the advertisement related information contains descriptive fields corresponding to an advertisement;

means for determining the extent to which an advertisement is viewed by the subscriber; and

means for storing the descriptive fields and the determination of the extent to which the advertisement is viewed by the subscriber.

133. The system described in claim 132, further comprising:

means for determining a subscriber product interests profile; and

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means for storing the subscriber product interests profile.

134. An interactive television system comprising:

an input device for allowing a subscriber to select source material to view;

a monitor for displaying the selected source material;

an advertisement monitoring device; and

a profile generator for generating a subscriber interest profile based on advertisements that the subscriber views.

135. The system of claim 134, wherein the advertisement monitoring device includes:

means for monitoring subscriber activity including subscriber selections;

means for retrieving advertisement related information corresponding to an advertisement; and

means for determining the extent to which an advertisement is viewed by the subscriber.

138. (In a client-server based architecture having a client side and a server side, a method for generating a

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subscriber profile vector for a subscriber, the method comprising:

monitoring subscriber viewing activities including capturing requests for source material initiated by the client side, and monitoring volume levels corresponding to the subscriber selection volumes;

generating subscriber selection data, wherein the subscriber selection data corresponds to a record of requests for the source material;

retrieving source related information, wherein the source related information includes descriptive fields corresponding to the source material;

processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile vector; and

storing the subscriber profile vector.

139. The method of claim 138, wherein said monitoring subscriber viewing activities further includes monitoring time durations corresponding to the viewing times of the requested source material.

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141. In a client-server based architecture having a client side and a server side, a method for generating a subscriber profile vector for a subscriber, the method comprising:

monitoring subscriber viewing activities including capturing requests for source material initiated by the client side;

generating subscriber selection data, wherein the subscriber selection data corresponds to a record of requests for the source material;

retrieving source related information, wherein the source related information includes descriptive fields corresponding to the source material;

processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile vector; and

storing the subscriber profile vector, wherein the subscriber profile vector includes household demographic data indicating probabilistic measurements of household demographics.

142. In a client-server based architecture having a client side and a server side, a method for generating a subscriber profile vector for a subscriber, the method comprising:

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monitoring subscriber viewing activities including capturing requests for source material initiated by the client side;

generating subscriber selection data, wherein the subscriber selection data corresponds to a record of requests for the source material;

retrieving source related information, wherein the source related information includes descriptive fields corresponding to the source material;

processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile vector; and

storing the subscriber profile vector, wherein the subscriber profile vector includes household program preference information indicating probabilistic measurements of household program interests.

143. In a client-server based architecture having a client side and a server side, a method for generating a subscriber profile vector for a subscriber, the method comprising:

monitoring subscriber viewing activities including capturing requests for source material initiated by the client side;

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generating subscriber selection data, wherein the subscriber selection data corresponds to a record of requests for the source material;

retrieving source related information, wherein the source related information includes descriptive fields corresponding to the source material;

processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile vector; and

storing the subscriber profile vector, wherein the subscriber profile vector includes household product preference information indicating probabilistic measurements of household product interests.

144. The method of claim 138, wherein said generating subscriber selection data includes context mining of textual information associated with the selected source material.

145. The method of claim 144, wherein the textual information includes text derived from closed-captioning data.

146. The method of claim 138, wherein said retrieving source related information includes retrieving source related

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information from an electronic program guide associated with the selected source material.

147. The method of claim 138, wherein said generating subscriber selection data includes generating subscriber selection data over a viewing session, and the subscriber profile vector corresponds to the viewing session.

148. The method described in claim 138, wherein said generating subscriber selection data includes generating subscriber selection data over multiple viewing sessions, and the subscriber profile vector corresponds to an average value for the multiple viewing sessions.

149. A data processing system for generating a subscriber profile vector in a client-server based architecture, the data processing system comprising:

means for transmitting a subscriber request for source material;

means for monitoring subscriber activity including

means for receiving the subscriber request for source material;

means for recording the requests for source material as subscriber selection data;

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means for retrieving source related information, wherein the source related information includes descriptive fields corresponding to the source material;

means for generating a program characteristics vector based on the source related information;

means for storing a set of heuristic rules;

means for processing the subscriber selection data with respect to the program characteristics vector and the set of heuristic rules to generate the subscriber profile vector; and

means for storing the subscriber profile vector.

150. The system described in claim 149, wherein the means for monitoring subscriber activity further includes means for monitoring time durations, wherein the time durations correspond to viewing times of the requested source material.

151. The system described in claim 149, wherein the means for monitoring subscriber activity further includes means for monitoring volume levels, wherein the volume levels correspond to subscriber selection volume levels.

152. The system described in claim 149, wherein the subscriber profile vector includes household demographic data

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indicating probabilistic measurements of household demographics.

153. The system described in claim 149, wherein the subscriber profile vector includes a household session interest profile indicating probabilistic measurements of household interests.

154. A data processing system for generating a household demographic characteristics vector in a client-server based architecture, the data processing system comprising:

means for allowing a subscriber to request source material;

means for monitoring subscriber activity including means for storing subscriber selection data, wherein the subscriber selection data corresponds to requested source material;

means for generating household viewing habits information from the subscriber selection data;

means for storing a set of heuristic rules;

means for processing the subscriber selection data with respect to the set of heuristic rules to generate the household demographic characteristics vector; and

means for storing the household demographic characteristics vector.

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155. The system described in claim 154, wherein the means for processing the subscriber selection data processes the subscriber selection data over a viewing session, and the generated household demographic characteristics vector corresponds to the viewing session.

156. The system described in claim 154, wherein the means for processing the subscriber selection data processes the subscriber selection data over a period of multiple viewing sessions, and the generated household demographic characteristics vector corresponds to an average value for the multiple viewing sessions.

158. A data processing system for generating a subscriber profile vector in a client-server based architecture, the data processing system comprising:

means for selecting source material for a subscriber to view;

means for receiving the subscriber selections for source material;

means for recording the subscriber selections for source material, wherein a record of the selections constitutes subscriber selection data;

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means for retrieving source related information, wherein the source related information includes descriptive fields corresponding to the source material;

means for processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile vector; and

means for storing the subscriber profile vector, wherein the subscriber profile vector includes household demographic data indicating probabilistic measurements of household demographics.

159. A data processing system for generating a subscriber profile vector in a client-server based architecture, the data processing system comprising:

means for selecting source material for a subscriber to view;

means for receiving the subscriber selections for source material;

means for recording the subscriber selections for source material, wherein a record of the selections constitutes subscriber selection data;

means for retrieving source related information, wherein the source related information includes descriptive fields corresponding to the source material;

means for processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile vector; and

means for storing the subscriber profile vector, wherein the subscriber profile vector includes household program preference information indicating probabilistic measurements of household program interests.

160. A data processing system for generating a subscriber profile vector in a client-server based architecture, the data processing system comprising:

means for selecting source material for a subscriber to view;

means for receiving the subscriber selections for source material;

means for recording the subscriber selections for source material, wherein a record of the selections constitutes subscriber selection data;

means for retrieving source related information, wherein the source related information includes descriptive fields corresponding to the source material;

means for processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile vector; and

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means for storing the subscriber profile vector, wherein the subscriber profile vector contains household product preference information indicating probabilistic measurements of household product interests.

161. The system described in claim 158, wherein the means for retrieving source related information includes means for context mining of textual information associated with the selected source material.

162. The system described in claim 161, wherein the textual information is text derived from closed-captioning data.

163. The system described in claim 158, wherein the means for retrieving source related information retrieves source related information from an electronic program guide associated with the selected source material.

164. The system described in claim 158, wherein the means for processing the subscriber selection data processes the subscriber selection data over a viewing session, and the generated household demographic characteristics vector corresponds to the viewing session.

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165. The system described in claim 158, wherein the means for processing the subscriber selection data processes the subscriber selection data over a period of multiple viewing sessions, and the generated household demographic characteristics vector corresponds to an average value for the multiple viewing sessions.

167. An Internet browsing system comprising:

an input device for allowing a subscriber to select source material to view;

a monitor for displaying the selected source material; and

a profile generator for generating a profile of the subscriber based on source material viewed, wherein the profile generator includes:

means for tracking the subscriber selections for source material;

means for the retrieving the source material;

means for generating a content characteristics vector based on the source material; and

means for processing the subscriber selections with respect to the content characteristics vector and a set of heuristic rules to generate a subscriber profile.

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168. An Internet browsing system comprising:

an input device for allowing a subscriber to select source material to view;

a monitor for displaying the selected source material; and

a profile generator for generating a profile of the subscriber based on source material viewed, wherein the profile generator includes:

means for monitoring subscriber activity;

means for generating viewing habits information from the subscriber activity; and

means for generating a viewer characteristics profile based on the viewing habits information and a set of heuristic rules.

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9/457256

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : G06F A2

(11) International Publication Number: **WO 00/33160**

(43) International Publication Date: 8 June 2000 (08.06.00)

(21) International Application Number: PCT/US99/28528

(22) International Filing Date: 2 December 1999 (02.12.99)

(30) Priority Data:

09/204,888	3 December 1998 (03.12.98)	US
09/205,119	3 December 1998 (03.12.98)	US
09/205,653	3 December 1998 (03.12.98)	US

(71) Applicant *(for all designated States except US)*: TELECOM PARTNERS LTD. [US/US]; 900 Town Center, New Britain, PA 18901 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: ELDERING, Charles, A. [US/US]; 315 Hedgerow Lane, Doylestown, PA 18901 (US). SYLLA, M., Lamine [SN/US]; 6 West Butler Avenue, New Britain, PA 18901 (US).

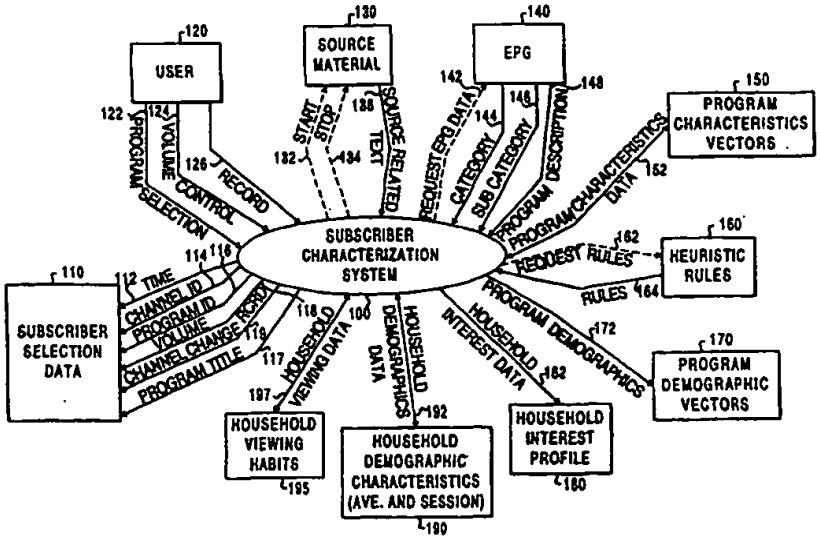
(74) Agents: BLASKO, John, P. et al.; J.P. Blasko Professional Corp., 107 North Broad Street, Doylestown, PA 18901 (US).

(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published

Without international search report and to be republished upon receipt of that report.

(54) Title: SUBSCRIBER CHARACTERIZATION AND ADVERTISEMENT MONITORING SYSTEM



(57) Abstract

A subscriber characterization and advertisement monitoring system (100) is presented in which subscriber viewing habits are monitored to determine demographic profiles. These profiles can be utilized for the matching of advertisements to subscribers based on their viewing habits and estimated demographics and product interests. The system (100) can be run locally in a television set-top (1808) or can be run in client server mode where channel selections are transmitted from the residence (1800) to a centralized switching location (server) (1840) such as a telephone office or Internet Service Provider. In client-server mode the channel selections are monitored at the centralized location (1840) which also performs the subscriber characterization. The system also provides the ability to monitor if advertisements were viewed and for what duration.

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TITLE

Subscriber characterization and advertisement monitoring system

Background of the Invention

Cable television service providers have typically provided one-way broadcast services but now offer high-speed data services and can combine traditional analog broadcasts with digital broadcasts and access to Internet web sites. Telephone companies can offer digital data and video programming on a switched basis over digital subscriber line technology. Although the subscriber may only be presented with one channel at a time, channel change requests are instantaneously transmitted to centralized switching equipment and the subscriber can access the programming in a broadcast-like manner. Internet Service Providers (ISPs) offer Internet access and can offer access to text, audio, and video programming which can also be delivered in a broadcast-like manner in which the subscriber selects "channels" containing programming of interest. Such channels may be offered as part of a video programming service or within a data service and can be presented within an Internet browser.

Advertisements are a part of daily life and certainly an important part of entertainment programming, where the payments for advertisements cover the cost of network television. A method, which provides a flexible billing plan to cable network users based on the amount of advertisements viewed is described in U.S. Patent No. 5,532,735, which discloses a method of advertisement selection for interactive services. A user associated with an interactive TV is presented with a program and a set of advertisements.

The user can indicate the amount of advertisements in the set of advertisements he wants to view.

While advertisements are sometimes beneficial to subscribers and deliver desired information regarding specific products or services, consumers generally view advertising as a "necessary evil" for broadcast-type entertainment. For example, a method for obtaining information on advertised services or products is described in U.S. Patent No. 5,708,478, which discloses a computer system for enabling radio listeners and television watchers to obtain advertising information. The system includes steps of determining whether an incoming video or audio signal includes advertisement specific data of an advertiser and capturing and storing the advertiser specific data.

Manufacturers pay an extremely high price to present, in 30 seconds or less, an advertisement for their product, which they hope a consumer will watch. Unfortunately for the manufacturer, the consumer frequently uses that interval of time to check the programming being presented on the other channels, and may not watch any of the advertisement. Alternately, the consumer may mute the channel and ignore what the manufacturer has presented. In any case the probability that the consumer has watched the advertisement is quite low. It is not until millions of dollars have been spent on an advertising campaign that a manufacturer can determine that the ads have been effective. This is presently accomplished by monitoring sales of the product or TV programs or channels viewed by users as disclosed in various public documents. As an example, U.S. Patent No. 4,546,382 discloses a television and market research data collection system and method. A data collection unit containing a memory stores data as to which of the plurality of TV modes are in use, which TV channel is being viewed as well as input from a suitable optical scanning device for

collecting information about user's product purchases. Another system described in U.S. Patent No. 4,258,386 discloses a television audience measuring system. The system monitors and stores information representative of channel identification, the time at which the channel is selected and the time at which the selection of a channel is terminated. U.S. Patent No. 5,608,445 discloses also a method and device for data capture in television viewer research. Devices are attached to a video installation in order to determine to which channel a set is tuned.

With the advent of the Internet manufacturers and service providers have found ways to selectively insert their advertisements based on a subscribers requests for information. As an example, an individual who searches for "cars" on the Internet may see an advertisement for a particular type of car. Various internet-based advertising use this method. The product literature from IMGIS Inc.," Ad Force," printed from the World Wide Web site http://www.starpt.com/core/ad_Target.html on June 30, 1998 discloses an ad targeting system. The system delivers ads to web sites visitors based on the content of the web page, time of day, day of the week, keyword, by the number of times a visitor sees an advertisement and by the order in which a series of advertisements are shown to a visitor. Nevertheless, unless the subscriber actually goes to the advertised web site, there is no way to determine if the advertisement has been watched. As the content on the Internet migrates to multimedia programming including audio and video, the costs for the advertising will increase, but unless the advertiser can be sure that a significant percentage of the message was watched or observed, the advertising is ineffective. Prior art products for generating reports of ad campaign are generally PC-centric as described in various product literature which include the

product literature from DoubleClick Inc., "DoubleClick: Reporting," printed from the World Wide Web (WWW) site http://www.doubleclick.net/dart/howi_repo.htm on June 19, 1998, which discloses the reporting capabilities of DoubleClick's Dynamic Advertising Reporting & Targeting (DART) product. The information in the reports includes daily impressions by advertisement type, average impression per day of week and by hour of day. The average response rate per user is also included in the reports. The product literature from Netgravity Inc. "AdServer 3," printed from the World Wide Web site http://www.netgravity.com/products/ on July 9, 1998 discloses Netgravity's Adserver 3 product for online advertisement. The product generates reports including the profiles of visitors who viewed an ad and site traffic throughout the day, week, month and year.

The product literature from Media Metrix "Frequently Asked Questions", printed from the World Wide Web site http://www.mediametrix.com/interact_mmfaq.htm on June 30, 1998 discloses Media Metrix software, PC Meter, that runs in the background of a PC and monitors everything being done on that machine. It determines who is using the PC by age, income, gender and geographic region and tracks usage of software application, commercial online services and detailed page level viewing of the World Wide Web. The marketing literature from Matchlogic Inc., "Centralized Ad Management," printed from the World Wide Web site http://www.matchlogic.com/docs/services2.htm on July 1, 1998 discloses Matchlogic services for ad management. The services include delivering advertisements based on pre-defined targeting criteria, generating reports on how many unique viewers saw which banner and how many times it was viewed. The product literature from Accipiter Inc.," Accipiter AdManager 2.0," printed from the World Wide Web site http://www.accipiter.com/products/ADManager/fab.html on

July 9, 1998 discloses Accipiter's ad management system. After delivering an advertisement based on pre-defined criteria, the system can generate reports on an ad campaign. The reports include visitors' demographic data, number of impressions and clicks generated from the entire site and by each ad and advertiser.

In order to deliver more targeted programming and advertising to subscribers, it is necessary to understand their likes and dislikes to a greater extent than is presently done today. Systems which identify subscriber preferences based on their purchases and responses to questionnaires allow for the targeted marketing of literature in the mail, but do not in any sense allow for the rapid and precise delivery of programming and advertising which is known to have a high probability of acceptance to the subscriber. Other systems give users the possibility to chose their programming as described in U.S. Patent No. 5,223,924 which discloses a system and method for automatically correlating user preferences with a TV program information database. The system includes a processor that performs "free text" search techniques to correlate the downloaded TV program information with the viewer's preferences. This system requires an interaction between the users and the programming. The white paper from Net Perceptions corporation entitled "Adding Value in the Digital Age" and printed from the World Wide Web site http://www.netperceptions.com/products/white-papers.html on June 30, 1998 discloses how the GroupLens Recommendation Engine gives online businesses the ability to target and personalize services, content, products and advertising. A learning process learns personal information about an individual using explicit and implicit ratings, a prediction process predicts user preference using collaborative

filtering and the recommendation process recommends products or services to users based on predictions.

The product literature from Aptex software Inc., "SelectCast for Commerce Servers," printed from the World Wide Web site http://www.aptex.com/products-selectcast-commerce.htm on June 30, 1998 describes the product SelectCast for Commerce Servers. It personalizes online shopping based on observed user behavior. User interests are learned based on the content they browse, the promotions they click and the products they purchase.

In order to determine which programming or advertising is appropriate for the subscriber, knowledge of that subscriber and the subscriber product and programming preferences is required. Different methods are being used to gain knowledge of user's preferences and to profile the users. Generally, these methods use content or data mining technologies to profile users or predict their preferences. Another technique for predicting user's preferences is based on the use of collaborative filtering as described in U.S. Patent No. 5,704,017 which discloses a collaborative filtering system utilizing a belief network. The system learns a belief network using prior knowledge obtained from an expert in a given field of decision making and a database containing empirical data such as users' attributes as well as their preferences in that decision making field. The belief network can determine the probability of the unknown preferences of the user given the known attributes and thus predicts the preference most likely to be desired by the user.

The product literature from Aptex software Inc., "SelectCast for Ad Servers," printed from the World Wide Web site http://www.aptex.com/products-selectcast-ads.htm on June 30, 1998 discloses an ad targeting system from Aptex Software Inc. The system employs neural networks and a

context vector data model to optimize relationships between users and content. It provides user profiling by mining the context and content of all actions including clicks, queries, page views and ad impressions. Aptex's technology uses a context vector data modeling technique described in U.S. Patent No. 5,619,709 which discloses a system and method of context vector generation and retrieval. Context vectors represent conceptual relationships among information items by quantitative means. A neural network operates on a training corpus of records to develop relationship-based context vectors based on word proximity and co-importance. Geometric relationships among context vectors are representative of conceptual relationships among their associated items.

The product Data sheet from Open Sesame, "Learn Sesame," printed from the World Wide Web site http://www.opensesame.com/prod_04.html on July 09, 1998 discloses Open Sesame's personalization product for Web enterprises. It learns about users automatically from their browsing behavior.

The product literature from Engage Technologies, "Engage.Discover," printed from the World Wide Web site http://www.engagetech.com on July 09, 1998 discloses Engage Technologies' product for user profiling. User-disclosed information such as interest, demographics and opinions are combined with anonymous clickstream data that describes where users come from before visiting the site, how long they stay, and what pages or types of pages they visit most frequently to build the visitor profile.

The marketing literature from Broadvision, "The Power of Personalization", printed from the World Wide Web site http://www.broadvision.com/content/corporate/brochure/Broch4.htm on August 21, 1998 discloses BroadVision One-to-One application profiling system. The system learns about users

through a variety of techniques including registration, questionnaires, observation and integration of historical and externally generated data.

The marketing literature from Firefly Corporation, "Firefly passport Office," printed from the World Wide Web site http://www.firefly.net/company/PassportOffice.html on June 20, 1998 discloses Firefly's Relationship Management software. The software enables online businesses to create, extend and manage personal profiles for every user.

Specific information regarding a subscriber's viewing habits or the Internet web sites they have accessed can be stored for analysis, but such records are considered private and subscribers are not generally willing to have such information leave their control. Although there are regulatory models, which permit the collection of such data on a "notice and consent" basis, there is a general tendency towards legal rules, which prohibit such raw data to be collected.

With the migration of services from a broadcast based model to a client-server based model in which subscribers make individualized request for programming to an Internet access provider or content provider, there is opportunity to monitor the subscriber viewing characteristics to better provide them with programming and advertising which will be of interest to them. A server may act as a proxy for the subscriber requests and thus be able to monitor what a subscriber has requested and is viewing. Since subscribers may not want this raw data to be utilized, there is a need for a system which can process this information and generate statistically relevant subscriber profiles. These profiles should be accessible to others on the network who may wish to determine if their programming or advertisements are suitable for the subscriber. In a broadcast-based model, the information to be processed can be embedded within the TV

program or broadcast separately and can be in form of an electronic program guide (EPG) or text information related to the program. As an example, U.S. Patent No. 5,579,055 discloses an electronic program guide (EPG) and text channel data controller. The text and EPG data are embedded in the vertical blanking interval of the video signal and extracted, at reception, by the data controller. The EPG contains information fields such as program category, program subcategory and program content description. U.S. Patent No. 5,596,373 discloses also a method and apparatus for providing program oriented information in a multiple station broadcasting system. The EPG data includes guide data, channel data and program data. The program data includes among other information, the program title, the program category, the program sub-category and a detailed description of the program.

For the foregoing reasons, there is a need for an advertisement monitoring system which can monitor which advertisements have been viewed by a subscriber. There is also a need for a subscriber characterization system which can generate and store subscriber characteristics which reflect the probable demographics and preferences of the subscriber and household.

Summary Of The Invention

The present invention encompasses a system for determining to what extent an advertisement has been viewed by a subscriber or household.

In a preferred embodiment subscriber selection data including the channel selected and the time at which it was selected are recorded. Advertisement related information including the type of product, brand name, and other descriptive information which categorizes the advertisement

is extracted from the advertisement or text information related to the advertisement including closed captioning text. Based on the subscriber selection data a record of what percentage of the advertisement was watched is created. This record can subsequently be used to make a measure of the effectiveness of the advertisement.

In a preferred embodiment the text information related to the advertisement is processed using context mining techniques which allow for classification of the advertisement and extraction of key data including product type and brand. Context mining techniques allow for determination of a product type, product brand name and in the case of a product which is not sold with a particular brand name, a generic name for the product.

The present invention can also be realized in a client-server mode in which case the subscriber executes channel changes at the client side of the network which are transmitted to the server side and fulfilled by the routing of a channel to the subscriber. The server side monitors the subscriber activity and stores the record of channel change requests. Advertisement related information is retrieved from the server side, which contains the advertising material itself, retrieves the advertising material from a third party, or analyzes the data stream carrying the advertising to the subscriber. The server side extracts descriptive fields from the advertisement and based on the subscriber selection data, determines the extent to which the advertisement was viewed by the subscriber. As an example the system can determine the percentage of the advertisement that was viewed by the subscriber.

The present invention includes a system for characterizing subscribers watching video or multimedia programming based on monitoring their detailed selection choices including the time duration of their viewing, the

volume the programming is listened at, the program selection, and collecting text information about that programming to determine what type of programming the subscriber is most interested in. In addition, the system can generate a demographic description of the subscriber or household which describes the probable age, income, gender and other demographics. The resulting characterization includes probabilistic determinations of what other programming or products the subscriber/household will be interested in.

In a preferred embodiment, the textual information which describes the programming is obtained by context mining of text associated with the programming. The associated text can be from the closed-captioning data associated with the programming, an electronic program guide, or from text files associated with or part of the programming itself.

The system can provide both session measurements which correspond to a profile obtained over a viewing session, or an average profile which corresponds to data obtained over multiple viewing sessions.

The present invention also encompasses the use of heuristic rules in logical form or expressed as conditional probabilities to aid in forming a subscriber profile. The heuristic rules in logical form allow the system to apply generalizations which have been learned from external studies to obtain a characterization of the subscriber. In the case of conditional probabilities, determinations of the probable content of a program can be applied in a mathematical step to a matrix of conditional probabilities to obtain probabilistic subscriber profiles indicating program and product likes and dislikes as well for determining probabilistic demographic data.

One advantage of the present invention is that it

allows consumers the possibility to permit access to probabilistic information regarding their household demographics and programming/product preferences, without revealing their specific viewing history. Subscribers may elect to permit access to this information in order to receive advertising which is more targeted to their likes/dislikes. Similarly, a subscriber may wish to sell access to this statistical data in order to receive revenue or receive a discount on a product or a service.

Another advantage of the present invention is that the resulting probabilistic information can be stored locally and controlled by the subscriber, or can be transferred to a third party which can provide access to the subscriber characterization. The information can also be encrypted to prevent unauthorized access in which case only the subscriber or someone authorized by the subscriber can access the data.

The present invention includes also a system for characterizing subscribers watching video or multimedia programming based on monitoring the requests made by the subscriber for programming to a server which contains the content or which requests the content from a third party. The server side of the network is able to monitor the subscriber's detailed selection choices including the time duration of their viewing, the volume the programming is listened at, and the program selection.

The server side collects text information about that programming to determine what type of programming the subscriber is most interested in. In addition the system can generate a demographic description of the subscriber or household which describes the probable age, income, gender and other demographics. The resulting characterization includes probabilistic determinations of what other

programming or products the subscriber/household will be interested in.

These and other features and objects of the invention will be more fully understood from the following detailed description of the preferred embodiments which should be read in light of the accompanying drawings.

Brief Description of the Drawings

The accompanying drawings, which are incorporated in and form a part of the specification, illustrate the embodiments of the present invention and, together with the description serve to explain the principles of the invention.

In the drawings:

FIG. 1 shows a context diagram for a subscriber characterization system.

FIG. 2 illustrates a block diagram for a realization of a subscriber monitoring system for receiving video signals;

FIG. 3 illustrates a block diagram of a channel processor;

FIG. 4 illustrates a block diagram of a computer for a realization of the subscriber monitoring system;

FIG. 5 illustrates a channel sequence and volume over a twenty-four (24) hour period;

FIG. 6 illustrates a time of day detailed record;

FIG. 7 illustrates a household viewing habits statistical table;

FIG. 8A illustrates an entity-relationship diagram for the generation of program characteristics vectors;

FIG. 8B illustrates a flowchart for program characterization;

FIGS. 9A illustrates a deterministic program category vector;

FIG. 9B illustrates a deterministic program sub-category vector;

FIG. 9C illustrates a deterministic program rating vector;

FIG. 9D illustrates a probabilistic program category vector;

FIG. 9E illustrates a probabilistic program sub-category vector;

FIG. 9F illustrates a probabilistic program content vector;

FIG. 10A illustrates a set of logical heuristic rules;

FIG. 10B illustrates a set of heuristic rules expressed in terms of conditional probabilities;

FIG. 11 illustrates an entity-relationship diagram for the generation of program demographic vectors;

FIG. 12 illustrates a program demographic vector;

FIG. 13 illustrates an entity-relationship diagram for the generation of household session demographic data and household session interest profiles;

FIG. 14 illustrates an entity-relationship diagram for the generation of average and session household demographic characteristics;

FIG. 15 illustrates average and session household demographic data;

FIG. 16 illustrates an entity-relationship diagram for generation of a household interest profile;

FIG. 17 illustrates household interest profile including programming and product profiles;

FIG. 18 illustrates a client-server architecture for realizing the present invention; and

FIG. 19 illustrates an advertisement monitoring table.

Detailed Description
Of The Preferred Embodiment

In describing a preferred embodiment of the invention illustrated in the drawings, specific terminology will be used for the sake of clarity. However, the invention is not intended to be limited to the specific terms so selected, and it is to be understood that each specific term includes all technical equivalents which operate in a similar manner to accomplish a similar purpose.

With reference to the drawings, in general, and FIGS. 1 through 19 in particular, the apparatus of the present invention is disclosed.

The present invention is directed at an apparatus for monitoring which advertisements are watched by a subscriber or a household.

In the present system the programming viewed by the subscriber, both entertainment and advertisement, can be studied and processed by the subscriber characterization system to determine the program characteristics. This determination of the program characteristics is referred to as a program characteristics vector. The vector may be a truly one-dimensional vector, but can also be represented as an n dimensional matrix which can be decomposed into vectors. For advertisements, the program characteristics vector can contain information regarding the advertisement including product type, features, brand or generic name, or other relevant advertising information.

The subscriber profile vector represents a profile of the subscriber (or the household of subscribers) and can be in the form of a demographic profile (average or session) or a program or product preference vector. The program and product preference vectors are considered to be part of a household interest profile which can be thought of as an n dimensional matrix representing probabilistic measurements

of subscriber interests.

In the case that the subscriber profile vector is a demographic profile, the subscriber profile vector indicates a probabilistic measure of the age of the subscriber or average age of the viewers in the household, sex of the subscriber, income range of the subscriber or household, and other such demographic data. Such information comprises household demographic characteristics and is composed of both average and session values. Extracting a single set of values from the household demographic characteristics can correspond to a subscriber profile vector.

The household interest profile can contain both programming and product profiles, with programming profiles corresponding to probabilistic determinations of what programming the subscriber (household) is likely to be interested in, and product profiles corresponding to what products the subscriber (household) is likely to be interested in. These profiles contain both an average value and a session value, the average value being a time average of data, where the averaging period may be several days, weeks, months, or the time between resets of unit.

Since a viewing session is likely to be dominated by a particular viewer, the session values may, in some circumstances, correspond most closely to the subscriber values, while the average values may, in some circumstances, correspond most closely to the household values.

FIG. 1 depicts the context diagram of a preferred embodiment of a Subscriber Characterization System (SCS) 100. A context diagram, in combination with entity-relationship diagrams, provide a basis from which one skilled in the art can realize the present invention. The present invention can be realized in a number of programming languages including C, C++, Perl, and Java, although the scope of the invention is not limited by the choice of a

particular programming language or tool. Object oriented languages have several advantages in terms of construction of the software used to realize the present invention, although the present invention can be realized in procedural or other types of programming languages known to those skilled in the art.

In generating a subscriber profile, the SCS 100 receives from a user 120 commands in the form of a volume control signal 124 or program selection data 122 which can be in the form of a channel change but may also be an address request which requests the delivery of programming from a network address. A record signal 126 indicates that the programming or the address of the programming is being recorded by the user. The record signal 126 can also be a printing command, a tape recording command, a bookmark command or any other command intended to store the program being viewed, or program address, for later use.

The material being viewed by the user 120 is referred to as source material 130. The source material 130, as defined herein, is the content that a subscriber selects and may consist of analog video, Motion Picture Expert Group (MPEG) digital video source material, other digital or analog material, Hypertext Markup Language (HTML) or other type of multimedia source material. The subscriber characterization system 100 can access the source material 130 received by the user 120 using a start signal 132 and a stop signal 134, which control the transfer of source related text 136 which can be analyzed as described herein.

In a preferred embodiment, the source related text 136 can be extracted from the source material 130 and stored in memory. The source related text 136, as defined herein, includes source related textual information including descriptive fields which are related to the source material 130, or text which is part of the source material 130

itself. The source related text 136 can be derived from a number of sources including but not limited to closed captioning information, Electronic Program Guide (EPG) material, and text information in the source itself (e.g. text in HTML files).

Electronic Program Guide (EPG) 140 contains information related to the source material 130 which is useful to the user 120. The EPG 140 is typically a navigational tool which contains source related information including but not limited to the programming category, program description, rating, actors, and duration. The structure and content of EPG data is described in detail in US Patent 5,596,373 assigned to Sony Corporation and Sony Electronics which is herein incorporated by reference. As shown in FIG. 1, the EPG 140 can be accessed by the SCS 100 by a request EPG data signal 142 which results in the return of a category 144, a sub-category 146, and a program description 148. EPG information can potentially include fields related to advertising.

In one embodiment of the present invention, EPG data is accessed and program information such as the category 144, the sub-category 146, and the program description 148 are stored in memory.

In another embodiment of the present invention, the source related text 136 is the closed captioning text embedded in the analog or digital video signal. Such closed captioning text can be stored in memory for processing to extract the program characteristic vectors 150.

One of the functions of the SCS 100 is to generate the program characteristics vectors 150 which are comprised of program characteristics data 152, as illustrated in FIG. 1. The program characteristics data 152, which can be used to create the program characteristics vectors 150 both in vector and table form, are examples of source related

information which represent characteristics of the source material. In a preferred embodiment, the program characteristics vectors 150 are lists of values which characterize the programming (source) material in according to the category 144, the sub-category 146, and the program description 148. The present invention may also be applied to advertisements, in which case program characteristics vectors contain, as an example, a product category, a product sub-category, and a brand name.

As illustrated in FIG. 1, the SCS 100 uses heuristic rules 160. The heuristic rules 160, as described herein, are composed of both logical heuristic rules as well as heuristic rules expressed in terms of conditional probabilities. The heuristic rules 160 can be accessed by the SCS 100 via a request rules signal 162 which results in the transfer of a copy of rules 164 to the SCS 100.

The SCS 100 forms program demographic vectors 170 from program demographics 172, as illustrated in FIG. 1. The program demographic vectors 170 also represent characteristics of source related information in the form of the intended or expected demographics of the audience for which the source material is intended.

Subscriber selection data 110 is obtained from the monitored activities of the user and in a preferred embodiment can be stored in a dedicated memory. In an alternate embodiment, the subscriber selection data 110 is stored in a storage disk. Information which is utilized to form the subscriber selection data 110 includes time 112, which corresponds to the time of an event, channel ID 114, program ID 116, volume level 118, channel change record 119, and program title 117. A detailed record of selection data is illustrated in FIG. 6.

In a preferred embodiment, a household viewing habits 195 illustrated in FIG. 1 is computed from the subscriber

selection data 110. The SCS 100 transfers household viewing data 197 to form household viewing habits 195. The household viewing data 197 is derived from the subscriber selection data 110 by looking at viewing habits at a particular time of day over an extended period of time, usually several days or weeks, and making some generalizations regarding the viewing habits during that time period.

The program characteristics vector 150 is derived from the source related text 136 and/or from the EPG 140 by applying information retrieval techniques. The details of this process are discussed in accordance with FIG. 8.

The program characteristics vector 150 is used in combination with a set of the heuristic rules 160 to define a set of the program demographic vectors 170 illustrated in FIG. 1 describing the audience the program is intended for.

One output of the SCS 100 is a household profile including household demographic characteristics 190 and a household interest profile 180. The household demographic characteristics 190 resulting from the transfer of household demographic data 192, and the household interest profile 180, resulting from the transfer of household interests data 182. Both the household demographics characteristics 190 and the household interest profile 180 have a session value and an average value, as will be discussed herein.

The monitoring system depicted in FIG. 2 is responsible for monitoring the subscriber activities, and can be used to realize the SCS 100. In a preferred embodiment, the monitoring system of FIG. 2 is located in a television set-top device or in the television itself. In an alternate embodiment, the monitoring system is part of a computer which receives programming from a network.

In an application of the system for television services, an input connector 220 accepts the video signal

coming either from an antenna, cable television input, or other network. The video signal can be analog or Digital MPEG. Alternatively, the video source may be a video stream or other multimedia stream from a communications network including the Internet.

In the case of either analog or digital video, selected fields are defined to carry EPG data or closed captioning text. For analog video, the closed captioning text is embedded in the vertical blanking interval (VBI). As described in US Patent 5,579,005, assigned to Scientific-Atlanta, Inc., the EPG information can be carried in a dedicated channel or embedded in the VBI. For digital video, the closed captioning text is carried as video user bits in a user_data field. The EPG data is transmitted as ancillary data and is multiplexed at the transport layer with the audio and video data.

Referring to FIG. 2, a system control unit 200 receives commands from the user 120, decodes the command and forwards the command to the destined module. In a preferred embodiment, the commands are entered via a remote control to a remote receiver 205 or a set of selection buttons 207 available at the front panel of the system control unit 200. In an alternate embodiment, the commands are entered by the user 120 via a keyboard.

The system control unit 200 also contains a Central Processing Unit (CPU) 203 for processing and supervising all of the operations of the system control unit 200, a Read Only Memory (ROM) 202 containing the software and fixed data, a Random Access Memory (RAM) 204 for storing data. CPU 203, RAM 204, ROM 202, and I/O controller 201 are attached to a master bus 206. A power supply in a form of battery can also be included in the system control unit 200 for backup in case of power outage.

An input/output (I/O) controller 201 interfaces the

system control unit 200 with external devices. In a preferred embodiment, the I/O controller 201 interfaces to the remote receiver 205 and a selection button such as the channel change button on a remote control. In an alternate embodiment, it can accept input from a keyboard or a mouse.

The program selection data 122 is forwarded to a channel processor 210. The channel processor 210 tunes to a selected channel and the media stream is decomposed into its basic components: the video stream, the audio stream, and the data stream. The video stream is directed to a video processor module 230 where it is decoded and further processed for display to the TV screen. The audio stream is directed to an audio processor 240 for decoding and output to the speakers.

The data stream can be EPG data, closed captioning text, Extended Data Service (EDS) information, a combination of these, or an alternate type of data. In the case of EDS the call sign, program name and other useful data are provided. In a preferred embodiment, the data stream is stored in a reserved location of the RAM 204. In an alternate embodiment, a magnetic disk is used for data storage. The system control unit 200 writes also in a dedicated memory, which in a preferred embodiment is the RAM 204, the selected channel, the time 112 of selection, the volume level 118 and the program ID 116 and the program title 117. Upon receiving the program selection data 122, the new selected channel is directed to the channel processor 210 and the system control unit 200 writes to the dedicated memory the channel selection end time and the program title 117 at the time 112 of channel change. The system control unit 200 keeps track of the number of channel changes occurring during the viewing time via the channel change record 119. This data forms part of the subscriber selection data 110.

The volume control signal 124 is sent to the audio processor 240. In a preferred embodiment, the volume level 118 selected by the user 120 corresponds to the listening volume. In an alternate embodiment, the volume level 118 selected by the user 120 represents a volume level to another piece of equipment such as an audio system (home theatre system) or to the television itself. In such a case, the volume can be measured directly by a microphone or other audio sensing device which can monitor the volume at which the selected source material is being listened.

A program change occurring while watching a selected channel is also logged by the system control unit 200. Monitoring the content of the program at the time of the program change can be done by reading the content of the EDS. The EDS contains information such as program title, which is transmitted via the VBI. A change on the program title field is detected by the monitoring system and logged as an event. In an alternate embodiment, an EPG is present and program information can be extracted from the EPG. In a preferred embodiment, the programming data received from the EDS or EPG permits distinguishing between entertainment programming and advertisements.

FIG. 3 shows the block diagram of the channel processor 210. In a preferred embodiment, the input connector 220 connects to a tuner 300 which tunes to the selected channel. A local oscillator can be used to heterodyne the signal to the IF signal. A demodulator 302 demodulates the received signal and the output is fed to an FEC decoder 304. The data stream received from the FEC decoder 304 is, in a preferred embodiment, in an MPEG format. In a preferred embodiment, system demultiplexer 306 separates out video and audio information for subsequent decompression and processing, as well as ancillary data which can contain program related information.

The data stream presented to the system demultiplexer 306 consists of packets of data including video, audio and ancillary data. The system demultiplexer 306 identifies each packet from the stream ID and directs the stream to the corresponding processor. The video data is directed to the video processor module 230 and the audio data is directed to the audio processor 240. The ancillary data can contain closed captioning text, emergency messages, program guide, or other useful information.

Closed captioning text is considered to be ancillary data and is thus contained in the video stream. The system demultiplexer 306 accesses the user data field of the video stream to extract the closed captioning text. The program guide, if present, is carried on data stream identified by a specific transport program identifier.

In an alternate embodiment, analog video can be used. For analog programming, ancillary data such as closed captioning text or EDS data are carried in a vertical blanking interval.

FIG. 4 shows the block diagram of a computer system for a realization of the subscriber monitoring system based on the reception of multimedia signals from a bi-directional network. A system bus 422 transports data amongst the CPU 203, the RAM 204, Read Only Memory - Basic Input Output System (ROM-BIOS) 406 and other components. The CPU 203 accesses a hard drive 400 through a disk controller 402. The standard input/output devices are connected to the system bus 422 through the I/O controller 201. A keyboard is attached to the I/O controller 201 through a keyboard port 416 and the monitor is connected through a monitor port 418. The serial port device uses a serial port 420 to communicate with the I/O controller 201. Industry Standard Architecture (ISA) expansion slots 408 and Peripheral Component Interconnect (PCI) expansion slots 410 allow additional

cards to be placed into the computer. In a preferred embodiment, a network card is available to interface a local area, wide area, or other network.

FIG. 5 illustrates a channel sequence and volume over a twenty-four (24) hour period. The Y-axis represents the status of the receiver in terms of on/off status and volume level. The X-axis represents the time of day. The channels viewed are represented by the windows 501-506, with a first channel 502 being watched followed by the viewing of a second channel 504, and a third channel 506 in the morning. In the evening a fourth channel 501 is watched, a fifth channel 503, and a sixth channel 505. A channel change is illustrated by a momentary transition to the "off" status and a volume change is represented by a change of level on the Y-axis.

A detailed record of the subscriber selection data 110 is illustrated in FIG. 6 in a table format. A time column 602 contains the starting time of every event occurring during the viewing time. A Channel ID column 604 lists the channels viewed or visited during that period. A program title column 603 contains the titles of all programs viewed. A volume column 601 contains the volume level 118 at the time 112 of viewing a selected channel.

A representative statistical record corresponding to the household viewing habits 195 is illustrated in FIG. 7. In a preferred embodiment, a time of day column 700 is organized in period of time including morning, mid-day, afternoon, night, and late night. In an alternate embodiment, smaller time periods are used. A minutes watched column 702 lists, for each period of time, the time in minutes in which the SCS 100 recorded delivery of programming. The number of channel changes during that period and the average volume are also included in that table in a channel changes column 704 and an average volume

column 706 respectively. The last row of the statistical record contains the totals for the items listed in the minutes watched column 702, the channel changes column 704 and the average volume 706.

FIG. 8A illustrates an entity-relationship diagram for the generation of the program characteristics vector 150. The context vector generation and retrieval technique described in US Patent 5,619,709, which is incorporated herein by reference, can be applied for the generation of the program characteristics vectors 150. Other techniques are well known by those skilled in the art.

Referring to FIG. 8A, the source material 130 or the EPG 140 are passed through a program characterization process 800 to generate the program characteristics vectors 150. The program characterization process 800 is described in accordance with FIG. 8B. Program content descriptors including a first program content descriptor 802, a second program content descriptor 804 and an nth program content descriptor 806, each classified in terms of the category 144, the sub-category 146, and other divisions as identified in the industry accepted program classification system, are presented to a context vector generator 820. As an example, the program content descriptor can be text representative of the expected content of material found in the particular program category 144. In this example, the program content descriptors 802, 804 and 806 would contain text representative of what would be found in programs in the news, fiction, and advertising categories respectively. The context vector generator 820 generates context vectors for that set of sample texts resulting in a first summary context vector 808, a second summary context vector 810, and an nth summary context vector 812. In the example given, the summary context vectors 808, 810, and 812 correspond to the categories of news, fiction and advertising respectively.

The summary vectors are stored in a local data storage system.

Referring to FIG. 8B, a sample of the source related text 136 which is associated with the new program to be classified is passed to the context vector generator 820 which generates a program context vector 840 for that program. The source related text 136 can be either the source material 130, the EPG 140, or other text associated with the source material. A comparison is made between the actual program context vectors and the stored program content context vectors by computing, in a dot product computation process 830, the dot product of the first summary context vector 808 with the program context vector 840 to produce a first dot product 814. Similar operations are performed to produce second dot product 816 and nth dot product 818.

The values contained in the dot products 814, 816 and 818, while not probabilistic in nature, can be expressed in probabilistic terms using a simple transformation in which the result represents a confidence level of assigning the corresponding content to that program. The transformed values add up to one. The dot products can be used to classify a program, or form a weighted sum of classifications which results in the program characteristics vectors 150. In the example given, if the source related text 136 was from an advertisement, the nth dot product 818 would have a high value, indicating that the advertising category was the most appropriate category, and assigning a high probability value to that category. If the dot products corresponding to the other categories were significantly higher than zero, those categories would be assigned a value, with the result being the program characteristics vectors 150 as shown in FIG. 9D.

For the sub-categories, probabilities obtained from the

content pertaining to the same sub-category 146 are summed to form the probability for the new program being in that sub-category 146. At the sub-category level, the same method is applied to compute the probability of a program being from the given category 144. The three levels of the program classification system; the category 144, the sub-category 146 and the content, are used by the program characterization process 800 to form the program characteristics vectors 150 which are depicted in FIGS. 9D-9F.

The program characteristics vectors 150 in general are represented in FIGS. 9A through 9F. FIGS. 9A, 9B and 9C are an example of deterministic program vectors. This set of vectors is generated when the program characteristics are well defined, as can occur when the source related text 136 or the EPG 140 contains specific fields identifying the category 144 and the sub-category 146. A program rating can also provided by the EPG 140.

In the case that these characteristics are not specified, a statistical set of vectors is generated from the process described in accordance with FIG. 8. FIG. 9D shows the probability that a program being watched is from the given category 144. The categories are listed in the X-axis. The sub-category 146 is also expressed in terms of probability. This is shown in FIG. 9E. The content component of this set of vectors is a third possible level of the program classification, and is illustrated in FIG. 9F.

FIG. 10A illustrates sets of logical heuristics rules which form part of the heuristic rules 160. In a preferred embodiment, logical heuristic rules are obtained from sociological or psychological studies. Two types of rules are illustrated in FIG. 10A. The first type links an individual's viewing characteristics to demographic characteristics such as gender, age, and income level. A

channel changing rate rule 1030 attempts to determine gender based on channel change rate. An income related channel change rate rule 1010 attempts to link channel change rates to income brackets. A second type of rules links particular programs to particular audience, as illustrated by a gender determining rule 1050 which links the program category 144/sub-category 146 with a gender. The result of the application of the logical heuristic rules illustrated in FIG. 10A are probabilistic determinations of factors including gender, age, and income level. Although a specific set of logical heuristic rules has been used as an example, a wide number of types of logical heuristic rules can be used to realize the present invention. In addition, these rules can be changed based on learning within the system or based on external studies which provide more accurate rules.

FIG. 10B illustrates a set of the heuristic rules 160 expressed in terms of conditional probabilities. In the example shown in FIG. 10B, the category 144 has associated with it conditional probabilities for demographic factors such as age, income, family size and gender composition. The category 144 has associated with it conditional probabilities that represent probability that the viewing group is within a certain age group dependent on the probability that they are viewing a program in that category 144.

FIG. 11 illustrates an entity-relationship diagram for the generation of the program demographic vectors 170. In a preferred embodiment, the heuristic rules 160 are applied along with the program characteristic vectors 150 in a program target analysis process 1100 to form the program demographic vectors 170. The program characteristic vectors 150 indicate a particular aspect of a program, such as its violence level. The heuristic rules 160 indicate that a particular demographic group has a preference for that

program. As an example, it may be the case that young males have a higher preference for violent programs than other sectors of the population. Thus, a program which has the program characteristic vectors 150 indicating a high probability of having violent content, when combined with the heuristic rules 160 indicating that "young males like violent programs," will result, through the program target analysis process 1100, in the program demographic vectors 170 which indicate that there is a high probability that the program is being watched by a young male.

The program target analysis process 1100 can be realized using software programmed in a variety of languages which processes mathematically the heuristic rules 160 to derive the program demographic vectors 170. The table representation of the heuristic rules 160 illustrated in FIG. 10B expresses the probability that the individual or household is from a specific demographic group based on a program with a particular category 144. This can be expressed, using probability terms as follow "the probability that the individuals are in a given demographic group conditional to the program being in a given category". Referring to FIG. 9D, the probability that the group has certain demographic characteristics based on the program being in a specific category is illustrated.

Expressing the probability that a program is destined to a specific demographic group can be determined by applying Bayes rule. This probability is the sum of the conditional probabilities that the demographic group likes the program, conditional to the category 144 weighted by the probability that the program is from that category 144. In a preferred embodiment, the program target analysis can calculate the program demographic vectors by application of logical heuristic rules, as illustrated in FIG. 10A, and by application of heuristic rules expressed as conditional

probabilities as shown in FIG. 10B. Logical heuristic rules can be applied using logical programming and fuzzy logic using techniques well understood by those skilled in the art, and are discussed in the text by S. V. Kartalopoulos entitled "Understanding Neural Networks and Fuzzy Logic" which is incorporated herein by reference.

Conditional probabilities can be applied by simple mathematical operations multiplying program context vectors by matrices of conditional probabilities. By performing this process over all the demographic groups, the program target analysis process 1100 can measure how likely a program is to be of interest to each demographic group. Those probabilities values form the program demographic vector 170 represented in FIG.12.

As an example, the heuristic rules expressed as conditional probabilities shown in FIG. 10B are used as part of a matrix multiplication in which the program characteristics vector 150 of dimension N, such as those shown in FIGS. 9A-9F is multiplied by an N x M matrix of heuristic rules expressed as conditional probabilities, such as that shown in FIG. 10B. The resulting vector of dimension M is a weighted average of the conditional probabilities for each category and represents the household demographic characteristics 190. Similar processing can be performed at the sub-category and content levels.

FIG. 12 illustrates an example of the program demographic vector 170, and shows the extent to which a particular program is destined to a particular audience. This is measured in terms of probability as depicted in FIG. 12. The Y-axis is the probability of appealing to the demographic group identified on the X-axis.

FIG. 13 illustrates an entity-relationship diagram for the generation of household session demographic data 1310 and household session interest profile 1320. In a preferred

embodiment, the subscriber selection data 110 is used along with the program characteristics vectors 150 in a session characterization process 1300 to generate the household session interest profile 1320. The subscriber selection data 110 indicates what the subscriber is watching, for how long and at what volume they are watching the program.

In a preferred embodiment, the session characterization process 1300 forms a weighted average of the program characteristics vectors 150 in which the time duration the program is watched is normalized to the session time (typically defined as the time from which the unit was turned on to the present). The program characteristics vectors 150 are multiplied by the normalized time duration (which is less than one unless only one program has been viewed) and summed with the previous value. Time duration data, along with other subscriber viewing information, is available from the subscriber selection data 110. The resulting weighted average of program characteristics vectors forms the household session interest profile 1320, with each program contributing to the household session interest profile 1320 according to how long it was watched. The household session interest profile 1320 is normalized to produce probabilistic values of the household programming interests during that session.

In an alternate embodiment, the heuristic rules 160 are applied to both the subscriber selection data 110 and the program characteristics vectors 150 to generate the household session demographic data 1310 and the household session interest profile 1320. In this embodiment, weighted averages of the program characteristics vectors 150 are formed based on the subscriber selection data 110, and the heuristic rules 160 are applied. In the case of logical heuristic rules as shown in FIG. 10A, logical programming can be applied to make determinations regarding the

household session demographic data 1310 and the household session interest profile 1320. In the case of heuristic rules in the form of conditional probabilities such as those illustrated in FIG. 10B, a dot product of the time averaged values of the program characteristics vectors can be taken with the appropriate matrix of heuristic rules to generate both the household session demographic data 1310 and the household session interest profile 1320.

Volume control measurements which form part of the subscriber selection data 110 can also be applied in the session characterization process 1300 to form a household session interest profile 1320. This can be accomplished by using normalized volume measurements in a weighted average manner similar to how time duration is used. Thus, muting a show results in a zero value for volume, and the program characteristics vector 150 for this show will not be averaged into the household session interest profile 1320.

FIG. 14 illustrates an entity-relationship diagram for the generation of average household demographic characteristics and session household demographic characteristics 190. A household demographic characterization process 1400 generates the household demographic characteristics 190 represented in table format in FIG. 15. The household demographic characterization process 1400 uses the household viewing habits 195 in combination with the heuristic rules 160 to determine demographic data. For example, a household with a number of minutes watched of zero during the day may indicate a household with two working adults. Both logical heuristic rules as well as rules based on conditional probabilities can be applied to the household viewing habits 195 to obtain the household demographics characteristics 190.

The household viewing habits 195 is also used by the system to detect out-of-habits events. For example, if a

household with a zero value for the minutes watched column 702 at late night presents a session value at that time via the household session demographic data 1310, this session will be characterized as an out-of-habits event and the system can exclude such data from the average if it is highly probable that the demographics for that session are greatly different than the average demographics for the household. Nevertheless, the results of the application of the household demographic characterization process 1400 to the household session demographic data 1310 can result in valuable session demographic data, even if such data is not added to the average demographic characterization of the household.

FIG. 15 illustrates the average and session household demographic characteristics. A household demographic parameters column 1501 is followed by an average value column 1505, a session value column 1503, and an update column 1507. The average value column 1505 and the session value column 1503 are derived from the household demographic characterization process 1400. The deterministic parameters such as address and telephone numbers can be obtained from an outside source or can be loaded into the system by the subscriber or a network operator at the time of installation. Updating of deterministic values is prevented by indicating that these values should not be updated in the update column 1507.

FIG. 16 illustrates an entity-relationship diagram for the generation of the household interest profile 180 in a household interest profile generation process 1600. In a preferred embodiment, the household interest profile generation process comprises averaging the household session interest profile 1320 over multiple sessions and applying the household viewing habits 195 in combination with the heuristic rules 160 to form the household interest profile

180 which takes into account both the viewing preferences of the household as well as assumptions about households/subscribers with those viewing habits and program preferences.

FIG. 17 illustrates the household interest profile 180 which is composed of a programming types row 1709, a products types row 1707, and a household interests column 1701, an average value column 1703, and a session value column 1705.

The product types row 1707 gives an indication as to what type of advertisement the household would be interested in watching, thus indicating what types of products could potentially be advertised with a high probability of the advertisement being watched in its entirety. The programming types row 1709 suggests what kind of programming the household is likely to be interested in watching. The household interests column 1701 specifies the types of programming and products which are statistically characterized for that household.

As an example of the industrial applicability of the invention, a household will perform its normal viewing routine without being requested to answer specific questions regarding likes and dislikes. Children may watch television in the morning in the household, and may change channels during commercials, or not at all. The television may remain off during the working day, while the children are at school and day care, and be turned on again in the evening, at which time the parents may "surf" channels, mute the television during commercials, and ultimately watch one or two hours of broadcast programming. The present invention provides the ability to characterize the household, and may make the determination that there are children and adults in the household, with program and product interests indicated in the household interest profile 180 corresponding to a

family of that composition. A household with two retired adults will have a completely different characterization which will be indicated in the household interest profile 180.

Although the present invention has been largely described in the context of a single computing platform receiving programming, the SCS 100 can be realized as part of a client-server architecture, as illustrated in FIG. 18. Referring to FIG. 18, residence 1800 contains a personal computer (PC) 1820 as well as the combination of a television 1810 and a set-top 1808, which can request and receive programming. The equipment in residence 1800, or similar equipment in a small or large business environment, forms the client side of the network as defined herein. Programming is delivered over an access network 1830, which may be a cable television network, telephone type network, or other access network. Information requests are made by the client side to a server 1840 which forms the server side of the network. Server 1840 has content locally which it provides to the subscriber, or requests content on behalf of the subscriber from a third party content provider 1860, as illustrated in FIG. 18. Requests made on behalf of the client side by server 1840 are made across a wide area network 1850 which can be the Internet or other public or private network. Techniques for making requests on behalf of a client are frequently referred to a proxy techniques and are well known to those skilled in the art. The server side receives the requested programming which is displayed on PC 1820 or television 1810 according to which device made the request.

In a preferred embodiment the server 1840 maintains the subscriber selection data 110 which it is able to compile based on its operation as a proxy for the client side. Retrieval of source related information and the program

target analysis process 1100, the program characterization process 800, the program target analysis process 1100, the session characterization process 1300, the household demographic characterization process 1400, and the household interest profile generation process 1600 can be performed by server 1840.

Referring to FIG. 19 an advertisement monitoring table is illustrated, in which an advertisement ID (AD ID) column 1915 contains a numerical ID for an advertisement which was transmitted with the advertisement in the form of a Program ID, http address, or other identifier which is uniquely associated with the advertisement. A product column 1921 contains a product description which indicates the type of product that was advertised. A brand column 1927 indicates the brand name of the product or can alternatively list a generic name for that product. A percent watched column 1933 indicates the percentage of the advertisement the subscriber viewed. In an alternate embodiment, a letter rating or other type of rating is used to indicate the probability that the advertisement was watched. A volume column 1937 indicates the volume level at which the advertisement was watched.

As an example of the industrial applicability of the invention, a manufacturer may develop an advertising strategy which includes the insertion of advertisements during popular evening programs. The costs for such ad insertions can be extremely high. In order to insure the cost effectiveness of this advertising strategy, the manufacturer has the advertisements placed during less watched but similar programs and monitors how subscribers react, and can determine approximately how many times the advertisement has been watched out of all of the possible viewings. This data can be used to confirm the potential effectiveness of the advertisement and to subsequently

determine if purchasing the more expensive time during evening programming will be cost-effective, or if the advertisement should be modified or placed in other programming.

Continuing this example, the manufacturer may place an advertisement for viewing during "prime time" for an initial period but can subsequently cancel broadcasts of the advertisement if it is found that the majority of subscribers never see the advertisement.

Although this invention has been illustrated by reference to specific embodiments, it will be apparent to those skilled in the art that various changes and modifications may be made which clearly fall within the scope of the invention. The invention is intended to be protected broadly within the spirit and scope of the appended claims.

Claims

What is claimed is:

1. A data processing system for monitoring advertisements watched by a subscriber, said data processing system comprising:

(a) computer processor means for processing data;

(b) storage means for storing data on a storage medium;

(c) first means for monitoring subscriber activity wherein said first means includes recording means for storing subscriber selections;

(d) second means for retrieving advertisement related information wherein said advertisement related information contains descriptive fields corresponding to said advertisement;

(e) third means for processing information wherein said third means includes means for determining the extent to which an advertisement is viewed by said subscriber; and

(f) fourth means for storing said descriptive fields and said determination of the extent to which said advertisement is viewed by said subscriber.

2. The system described in claim 1 wherein said first means for monitoring subscriber activity further comprises means for monitoring volume levels wherein said volume levels correspond to subscriber selection volume levels.

3. The system described in claim 1 further comprising:

(g) fifth means for determining a subscriber product interests profile; and

(h) sixth means for storing said subscriber products interests profile.

4. The system described in claim 1 wherein said second means for retrieving advertisement related information further comprises a means for context mining of textual information associated with said selected source material.

5. The system described in claim 4 wherein said textual information is text derived from closed-captioning data associated with said advertisement.

6. The system described in claim 5 wherein said text derived from closed-captioning data associated with said advertisement includes a product name field.

7. The system described in claim 4 wherein said text derived from closed-captioning data associated with said advertisement includes a product brand field.

8. A client-server based data processing system for monitoring advertisements watched by a subscriber, said client-server based data processing system comprising:

(a) first computer processor means at a client side for receiving and displaying advertisements wherein said first computer means is capable of transmitting channel change requests;

(b) second computer processor means at a server side for receiving said channel change requests and for processing data;

(c) second storage means associated with second computer processor means for storing data on a storage medium;

(d) first means at said server side for monitoring subscriber activity wherein said first means for monitoring subscriber activity includes receiving means for receiving subscriber channel change requests, recording means for storing subscriber channel change requests;

(e) second means at said server side for retrieving advertisement related information wherein said advertisement related information contains descriptive fields corresponding to an advertisement;

(f) third means at said server side for processing information wherein said third means includes means for determining the extent to which an advertisement is viewed by said subscriber; and

(g) fourth means at said server side for storing said descriptive fields and said determination of the extent to which said advertisement is viewed by said subscriber.

9. The system described in claim 8 further comprising:

(h) fifth means for determining a subscriber product interests profile; and

(i) sixth means for storing said subscriber product interests profile.

10. The system described in claim 8 wherein said second means for retrieving advertisement related information further comprises a means for context mining of textual information associated with said selected source material.

11. The system described in claim 10 wherein said textual information is text derived from closed-captioning data associated with said advertisement.

12. The system described in claim 11 wherein said text derived from closed-captioning data associated with said advertisement includes a product name field.

13. The system described in claim 11 wherein said text derived from closed-captioning data associated with said advertisement includes a product brand field.

14. A data processing system for generating a subscriber profile vector, said data processing system comprising:

(a) computer processor means for processing data;

(b) storage means for storing data on a storage medium;

(c) first means for monitoring subscriber activity wherein said first means includes recording means for storing subscriber selection data wherein said subscriber selection data corresponds to selected source material;

(d) second means for retrieving source related information wherein said source related information contains descriptive fields corresponding to said selected source material;

(e) third means for processing information wherein said third means includes means for processing said subscriber selection data with respect to said descriptive fields to form said subscriber profile vector; and

(f) fourth means for storing said subscriber profile vector.

15. The system described in claim 14 wherein said first means for monitoring subscriber activity further comprises means for monitoring time durations wherein said time durations correspond to viewing times of said selected source material.

16. The system described in claim 14 wherein said first means for monitoring subscriber activity further comprises means for monitoring volume levels wherein said volume levels correspond to subscriber selection volume levels.

17. The system described in claim 14 wherein said subscriber profile vector contains household demographic data indicating probabilistic measurements of household demographics.

18. The system described in claim 14 wherein said subscriber profile vector contains household program preference information indicating probabilistic measurements of household program interests.

19. The system described in claim 14 wherein said subscriber profile vector contains household product preference information indicating probabilistic measurements of household product interests.

20. The system described in claim 14 wherein said second means for retrieving source related information further comprises a means for context mining of textual information associated with said selected source material.

21. The system described in claim 20 wherein said textual information is text derived from closed-captioning data associated with said selected source material.

22. The system described in claim 14 wherein said second means for retrieving source related information further comprises a means for retrieving information associated with said selected source material from an electronic program guide.

23. The system described in claim 14 wherein said third means for processing information processes information over a viewing session and wherein said subscriber profile vector corresponds to said viewing session.

24. The system described in claim 14 wherein said third means for processing information processes information over multiple viewing sessions and wherein said subscriber profile vector corresponds to an average value over said multiple viewing sessions.

25. A data processing system for generating a subscriber profile vector, said data processing system comprising:

(a) computer processor means for processing data;

(b) storage means for storing data on a storage medium;

(c) first means for monitoring subscriber activity wherein said first means includes recording means for storing subscriber selection data wherein said subscriber selection data corresponds to selected source material;

(d) second means for retrieving source related information wherein said source related information contains descriptive fields corresponding to said selected source material;

(e) third means for generating a program characteristics vector based on said source related information;

(f) fourth means for storing a set of heuristic rules;

(g) fifth means for processing information wherein said fifth means includes means for processing said subscriber selection data with respect to said program characteristics vector and said set of heuristic rules to form said subscriber profile vector; and

(h) sixth means for storing said subscriber profile vector.

26. The system described in claim 25 wherein said first means for monitoring subscriber activity further comprises means for monitoring time durations wherein said time durations correspond to viewing times of said selected source material.

27. The system described in claim 25 wherein said first means for monitoring subscriber activity further comprises means for monitoring volume levels wherein said volume levels correspond to subscriber selection volume levels.

28. The system described in claim 25 wherein said subscriber profile vector contains household demographic data indicating probabilistic measurements of household demographics.

29. The system described in claim 25 wherein said subscriber profile vector contains a household session interest profile indicating probabilistic measurements of household interests.

30. A data processing system for generating a household demographic characteristics vector, said data processing system comprising:

(a) computer processor means for processing data;

(b) storage means for storing data on a storage medium;

(c) first means for monitoring subscriber activity wherein said first means includes recording means for storing subscriber selection data wherein said subscriber selection data corresponds to selected source material;

(d) second means for generating household viewing habits information wherein said household viewing habits information is generated from said subscriber selection data;

(e) third means for storing a set of heuristic rules;

(f) fourth means for processing information wherein said fourth means includes means for processing said subscriber selection data with respect to said set of heuristic rules to form said household demographic characteristics vector; and

(g) fifth means for storing said household demographic characteristics vector.

31. The system described in claim 30 wherein said fourth means for processing information processes information over a viewing session and wherein said household demographic characteristics vector corresponds to said viewing session.

32. The system described in claim 30 wherein said fourth means for processing information processes information over

a period of multiple viewing sessions wherein said household demographic characteristics vector corresponds to an average value over said multiple viewing sessions.

33. A data processing system for generating a subscriber profile vector in a client-server based architecture, said data processing system comprising:

(a) first computer processor means at a client side for requesting and displaying source information wherein said first computer means transmits a request for source material and receives and displays said source material;

(b) second computer processor means at a server side for processing data;

(c) second storage means associated with second computer processor means for storing data on a storage medium;

(d) first means at said server side for monitoring subscriber activity wherein said first means for monitoring subscriber activity includes receiving means for receiving subscriber requests for said source material, recording means for storing subscriber selection data wherein said subscriber selection data corresponds to a record of requests for said source material;

(e) second means at said server side for retrieving source related information wherein said source related information contains descriptive fields corresponding to said source material;

(f) third means at said server side for processing information wherein said third means includes means for processing said subscriber

selection data with respect to said descriptive fields to form said subscriber profile vector; and

(g) fourth means at said server side for storing said subscriber profile vector.

34. The system described in claim 33 wherein said first means for monitoring subscriber activity further comprises means for monitoring time durations wherein said time durations correspond to viewing times of said selected source material.

35. The system described in claim 33 wherein said first means for monitoring subscriber activity further comprises means for monitoring volume levels wherein said volume levels correspond to subscriber selection volume levels.

36. The system described in claim 33 wherein said subscriber profile vector contains household demographic data indicating probabilistic measurements of household demographics.

37. The system described in claim 33 wherein said subscriber profile vector contains household program preference information indicating probabilistic measurements of household program interests.

38. The system described in claim 33 wherein said subscriber profile vector contains household product preference information indicating probabilistic measurements of household product interests.

39. The system described in claim 33 wherein said second means for retrieving source related information further

comprises a means for context mining of textual information associated with said selected source material.

40. The system described in claim 39 wherein said textual information is text derived from closed-captioning data associated with said selected source material.

41. The system described in claim 33 wherein said second means for retrieving source related information further comprises a means for retrieving information associated with said selected source material from an electronic program guide.

42. The system described in claim 33 wherein said third means for processing information processes information over a viewing session and wherein said subscriber profile vector corresponds to said viewing session.

43. The system described in claim 33 wherein said third means for processing information processes information over multiple viewing sessions and wherein said subscriber profile vector corresponds to an average value over said multiple viewing sessions.

44. A data processing system for generating a subscriber profile vector in a client-server based architecture, said data processing system comprising:

(a) first computer processor means at a client side for requesting and displaying source information wherein said first computer means transmits a request for source material and receives and displays said source material;

(b) second computer processor means at a server side for processing data;

(c) second storage means associated with second computer processor means for storing data on a storage medium;

(d) first means at said server side for monitoring subscriber activity wherein said first means for monitoring subscriber activity includes receiving means for receiving subscriber requests for said source material, recording means for storing subscriber selection data wherein said subscriber selection data corresponds to a record of requests for said source material;

(e) second means at said server side for retrieving source related information wherein said source related information contains descriptive fields corresponding to said source material;

(f) third means at said server side for generating a program characteristics vector based on said source related information;

(g) fourth means at said server side for storing a set of heuristic rules;

(h) fifth means at said server side for processing information wherein said fifth means includes means for processing said subscriber selection data with respect to said program characteristics vector and said set of heuristic rules to form said subscriber profile vector; and

(i) sixth means at said server side for storing said subscriber profile vector.

45. The system described in claim 44 wherein said first means for monitoring subscriber activity further comprises

means for monitoring time durations wherein said time durations correspond to viewing times of said selected source material.

46. The system described in claim 44 wherein said first means for monitoring subscriber activity further comprises means for monitoring volume levels wherein said volume levels correspond to subscriber selection volume levels.

47. The system described in claim 44 wherein said subscriber profile vector contains household demographic data indicating probabilistic measurements of household demographics.

48. The system described in claim 44 wherein said subscriber profile vector contains a household session interest profile indicating probabilistic measurements of household interests.

49. A data processing system for generating a household demographic characteristics vector in a client-server based architecture, said data processing system comprising:

(a) first computer processor means at a client side for requesting and displaying source information wherein said first computer means transmits a request for source material and receives and displays said source material;

(b) second computer processor means at a server side for processing data;

(c) first means at said server side for monitoring subscriber activity wherein said first means includes recording means for storing subscriber selection data wherein said

subscriber selection data corresponds to selected source material;

(d) second means at said client side for generating household viewing habits information wherein said household viewing habits information is generated from said subscriber selection data;

(e) third means at said server side for storing a set of heuristic rules;

(f) fourth means at said server side for processing information wherein said fourth means includes means for processing said subscriber selection data with respect to said set of heuristic rules to form said household demographic characteristics vector; and

(g) fifth means at said server side for storing said household demographic characteristics vector.

50. The system described in claim 49 wherein said fourth means for processing information processes information over a viewing session and wherein said household demographic characteristics vector corresponds to said viewing session.

51. The system described in claim 49 wherein said fourth means for processing information processes information over a period of multiple viewing sessions wherein said household demographic characteristics vector corresponds to an average value over said multiple viewing sessions.

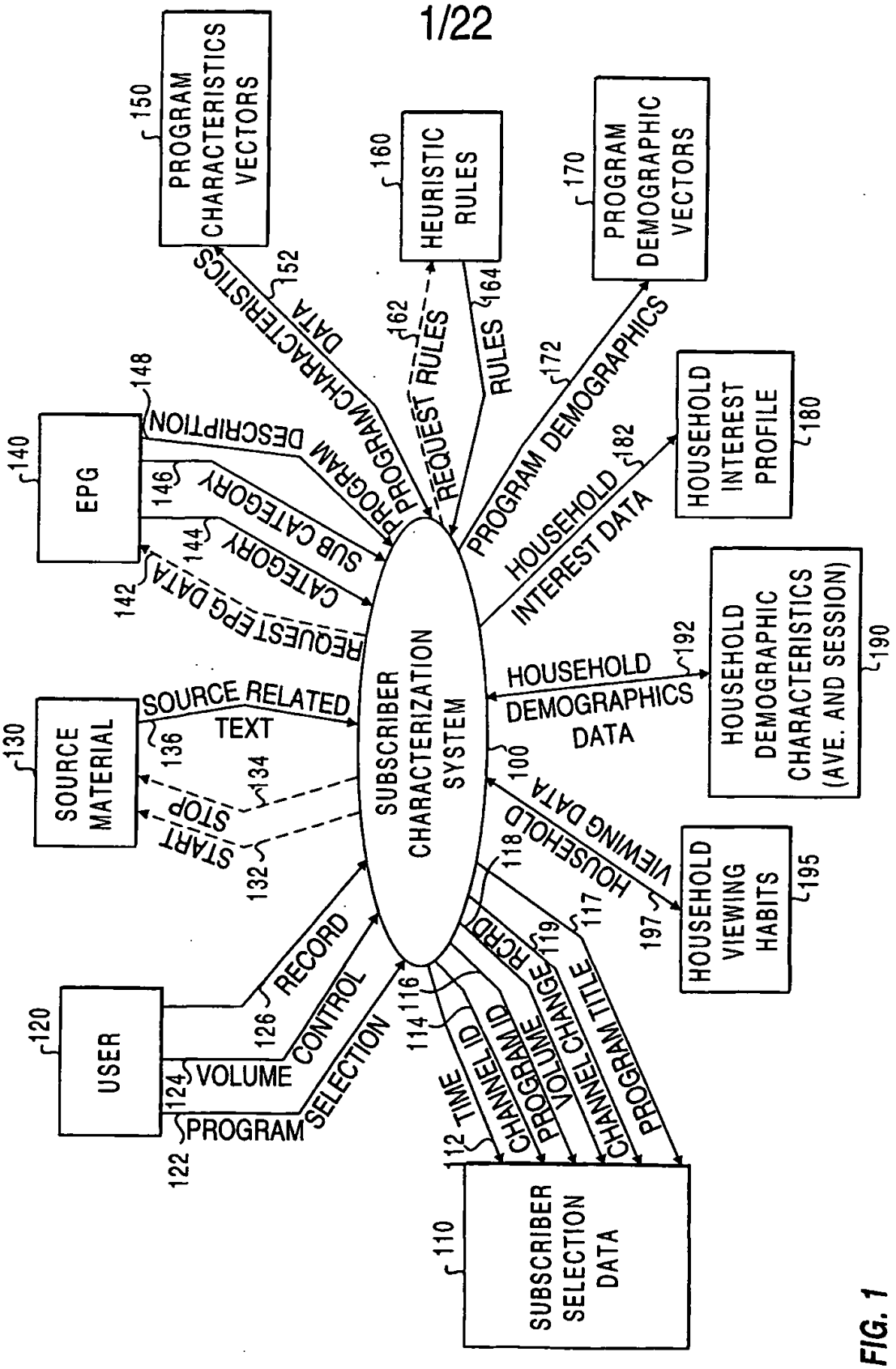

PROGRAM CHARACTERISTICS VECTORS
150
HEURISTIC RULES
160
PROGRAM DEMOGRAPHIC VECTORS
170
DATA
152
PROGRAM CHARACTERISTICS
REQUEST RULES
162
RULES
164
PROGRAM DEMOGRAPHICS
172
EPG
140
148
PROGRAM DESCRIPTION
146
SUB CATEGORY
144
CATEGORY
142
REQUEST EPG DATA
HOUSEHOLD INTEREST DATA
182
HOUSEHOLD INTEREST PROFILE
180
SUBSCRIBER CHARACTERIZATION SYSTEM
SOURCE MATERIAL
130
SOURCE RELATED TEXT
136
134
STOP
START
132
HOUSEHOLD DEMOGRAPHICS DATA
192
HOUSEHOLD DEMOGRAPHIC CHARACTERISTICS (AVE. AND SESSION)
190
100
HOUSEHOLD VIEWING DATA
118
HOUSEHOLD VIEWING HABITS
195
197
117
USER
120
RECORD
126
CONTROL
VOLUME
124
PROGRAM SELECTION
122
114
116
TIME
112
CHANNEL ID
PROGRAM
VOLUME CHANGE
CHANNEL TITLE
PROGRAM
119
SUBSCRIBER SELECTION DATA
110

FIG. 1

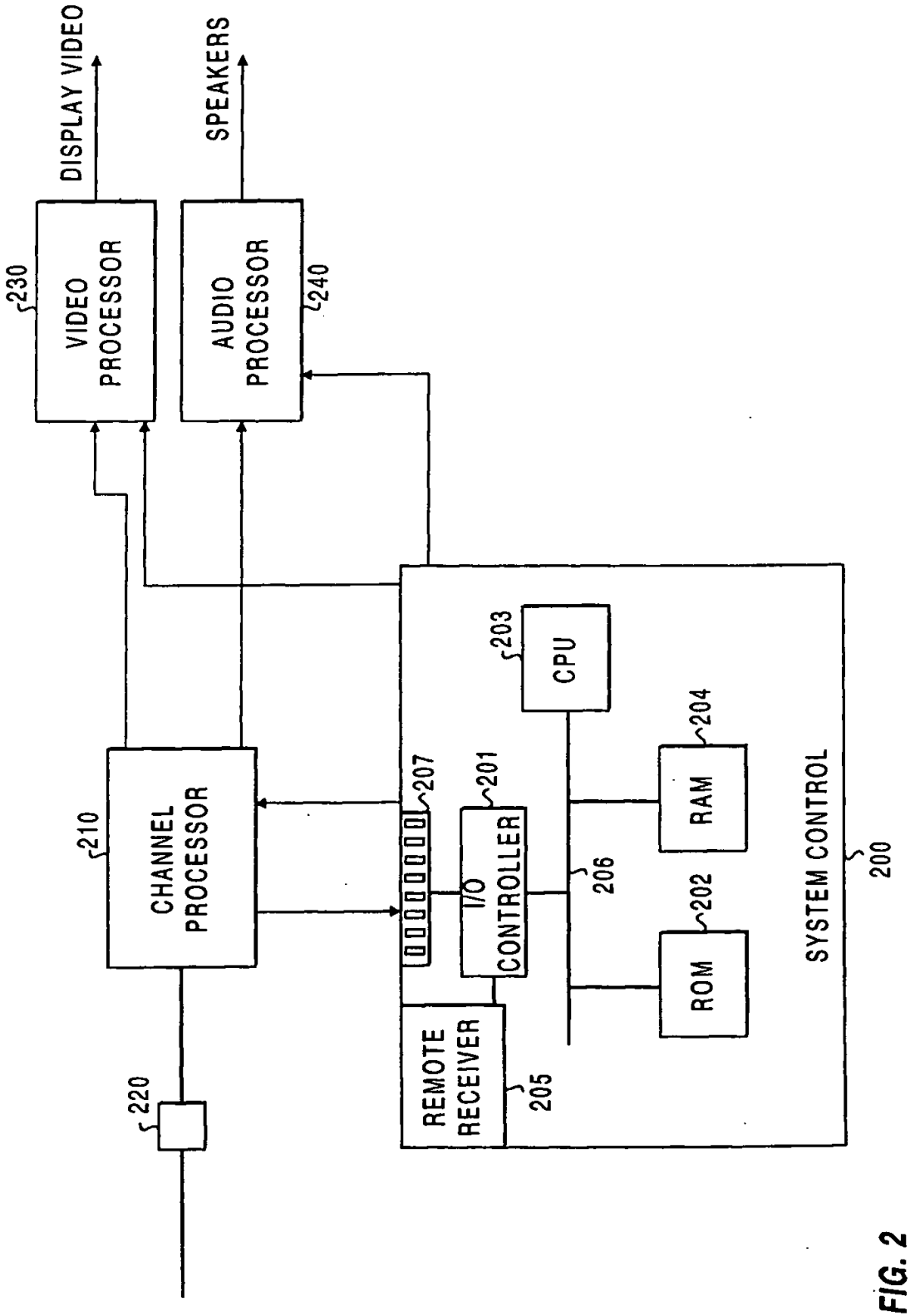

DISPLAY VIDEO
SPEAKERS
230
VIDEO PROCESSOR
240
AUDIO PROCESSOR
210
CHANNEL PROCESSOR
220
203
CPU
204
RAM
207
201
I/O CONTROLLER
206
202
ROM
REMOTE RECEIVER
205
SYSTEM CONTROL
200

FIG. 2

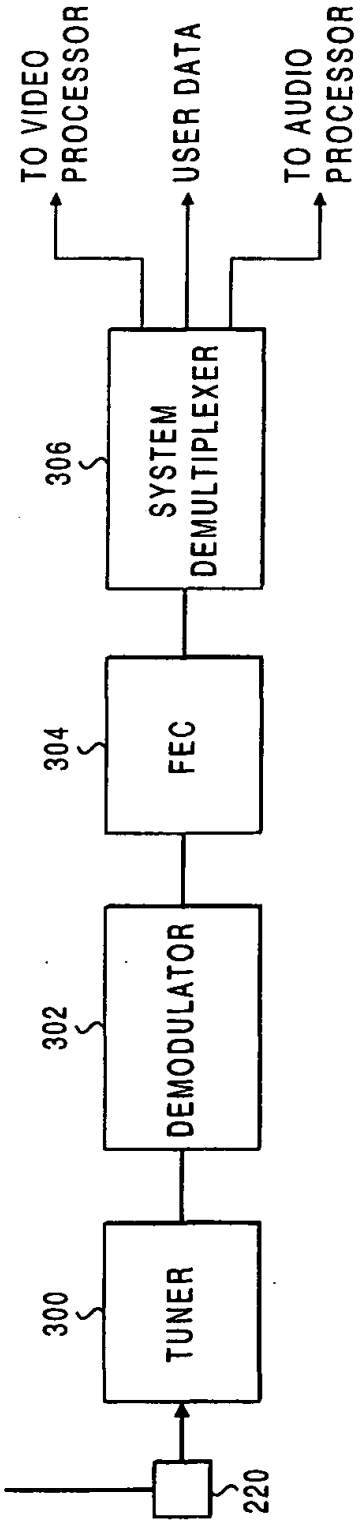

TO VIDEO PROCESSOR
USER DATA
TO AUDIO PROCESSOR
306
SYSTEM DEMULTIPLEXER
304
FEC
302
DEMODULATOR
300
TUNER
220

FIG. 3

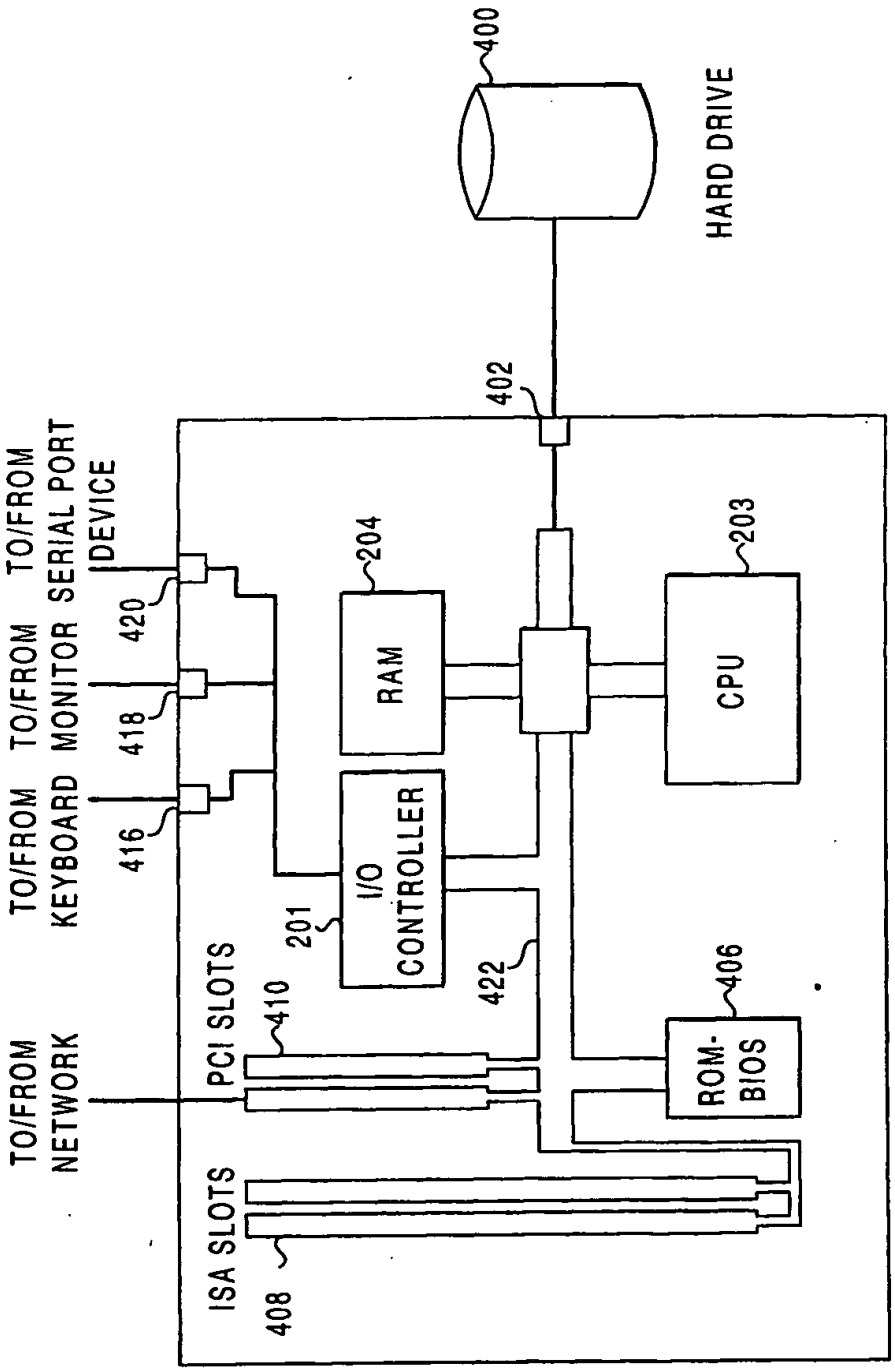

400
HARD DRIVE
402
TO/FROM SERIAL PORT DEVICE
TO/FROM MONITOR
TO/FROM KEYBOARD
TO/FROM NETWORK
420
418
416
204
RAM
203
CPU
I/O CONTROLLER
201
422
406
ROM-BIOS
PCI SLOTS
410
ISA SLOTS
408

FIG. 4

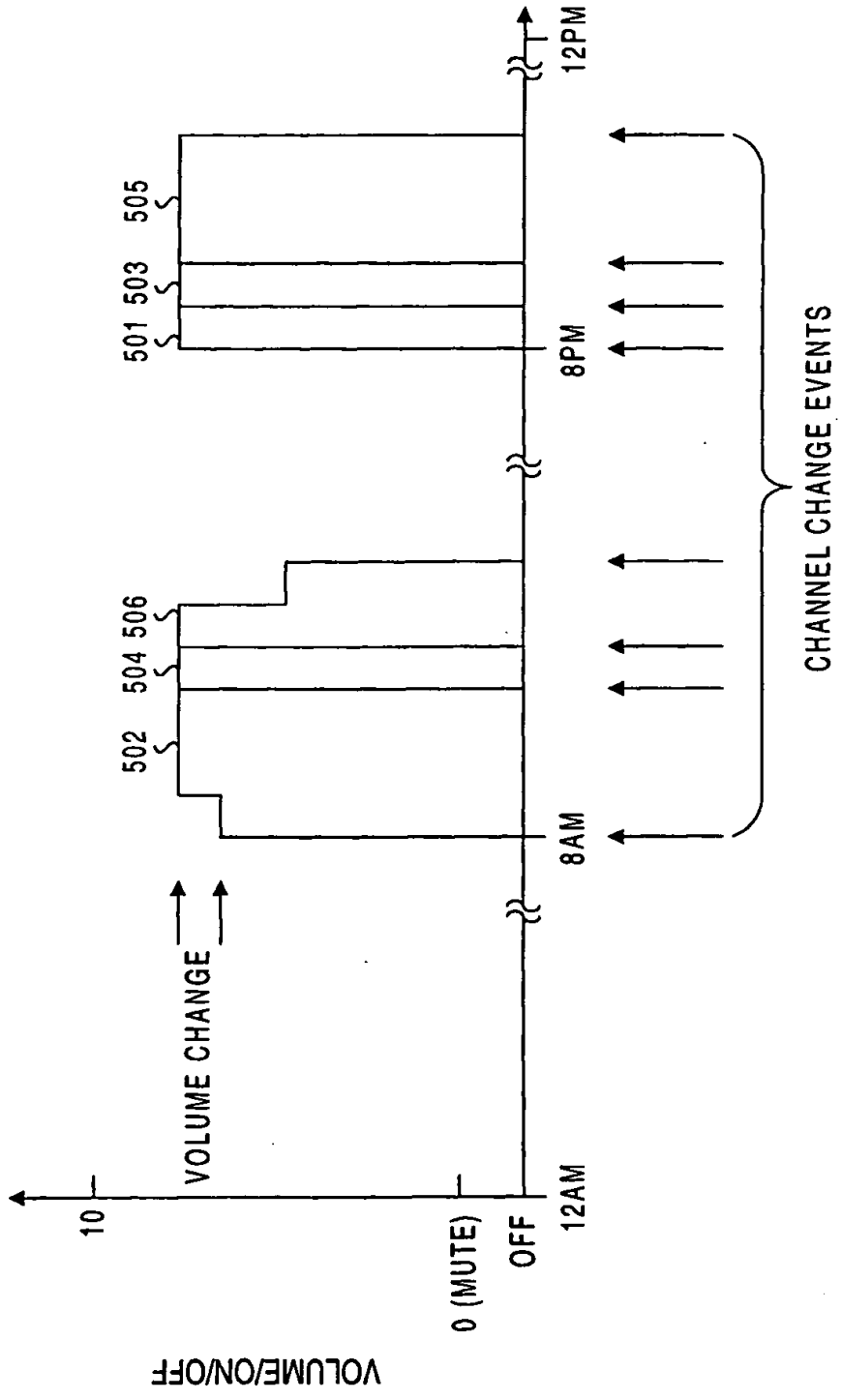

VOLUME/ON/OFF
10
VOLUME CHANGE
0 (MUTE)
OFF
12AM
8AM
8PM
12PM
501
503
505
502
504
506
CHANNEL CHANGE EVENTS

FIG. 5

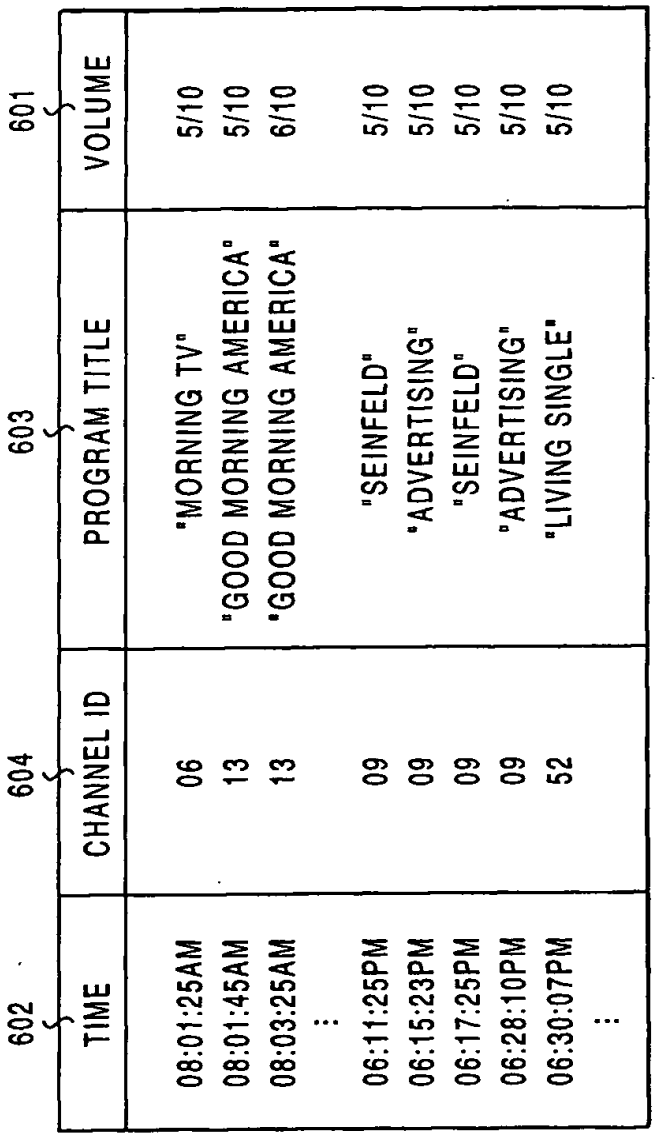
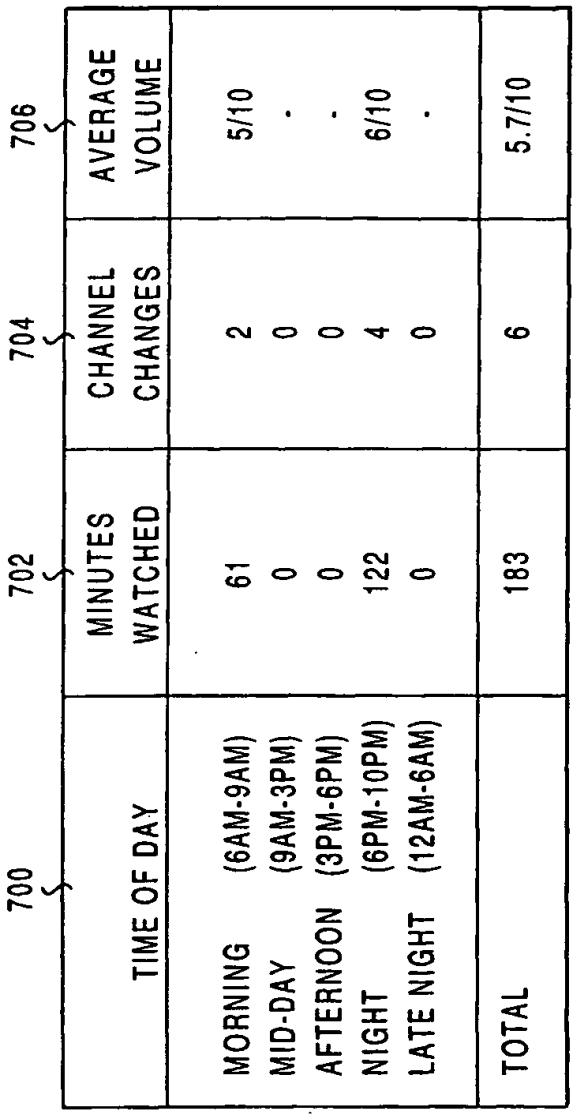

602
604
603
601
TIME
CHANNEL ID
PROGRAM TITLE
VOLUME
08:01:25AM
06
"MORNING TV"
5/10
08:01:45AM
13
"GOOD MORNING AMERICA"
5/10
08:03:25AM
13
"GOOD MORNING AMERICA"
6/10
06:11:25PM
09
"SEINFELD"
5/10
06:15:23PM
09
"ADVERTISING"
5/10
06:17:25PM
09
"SEINFELD"
5/10
06:28:10PM
09
"ADVERTISING"
5/10
06:30:07PM
52
"LIVING SINGLE"
5/10

FIG. 6



TIME OF DAY	MINUTES WATCHED	CHANNEL CHANGES	AVERAGE VOLUME
MORNING (6AM-9AM)	61	2	5/10
MID-DAY (9AM-3PM)	0	0	-
AFTERNOON (3PM-6PM)	0	0	-
NIGHT (6PM-10PM)	122	4	6/10
LATE NIGHT (12AM-6AM)	0	0	-
TOTAL	183	6	5.7/10

FIG. 7

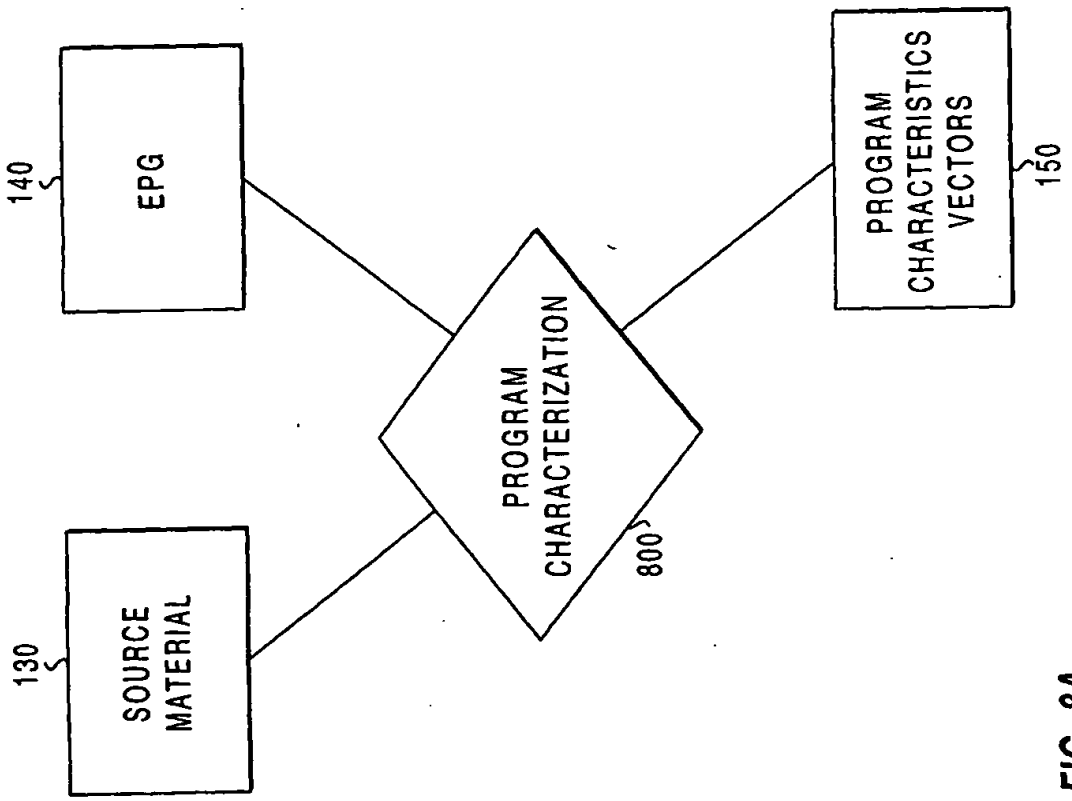

140
EPG
130
SOURCE MATERIAL
PROGRAM CHARACTERIZATION
800
PROGRAM CHARACTERISTICS VECTORS
150

FIG. 8A

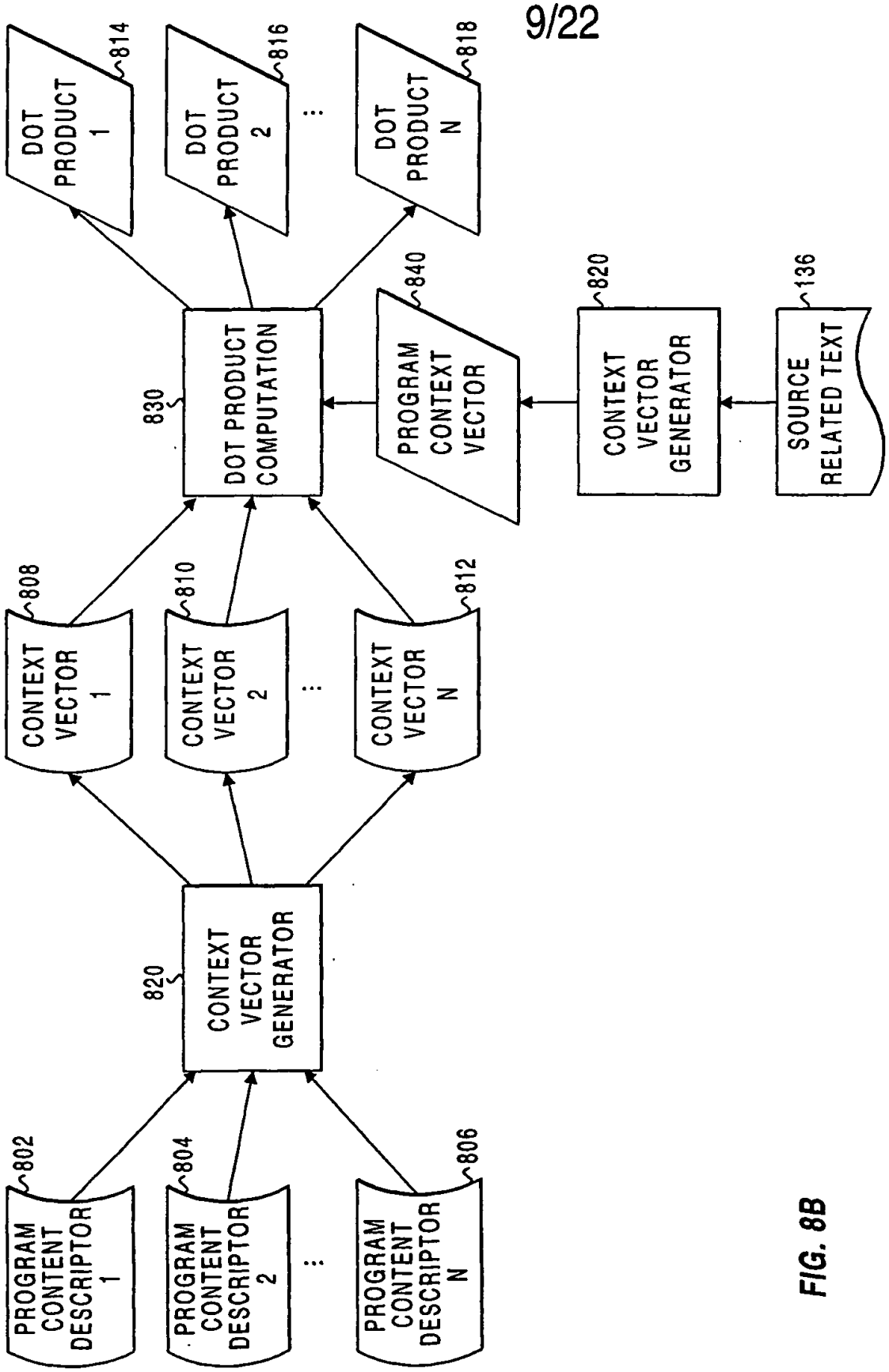

PROGRAM CONTENT DESCRIPTOR 1
802
PROGRAM CONTENT DESCRIPTOR 2
804
PROGRAM CONTENT DESCRIPTOR N
806
CONTEXT VECTOR GENERATOR
820
CONTEXT VECTOR 1
808
CONTEXT VECTOR 2
810
CONTEXT VECTOR N
812
DOT PRODUCT COMPUTATION
830
PROGRAM CONTEXT VECTOR
840
CONTEXT VECTOR GENERATOR
820
SOURCE RELATED TEXT
136
DOT PRODUCT 1
814
DOT PRODUCT 2
816
DOT PRODUCT N
818

FIG. 8B

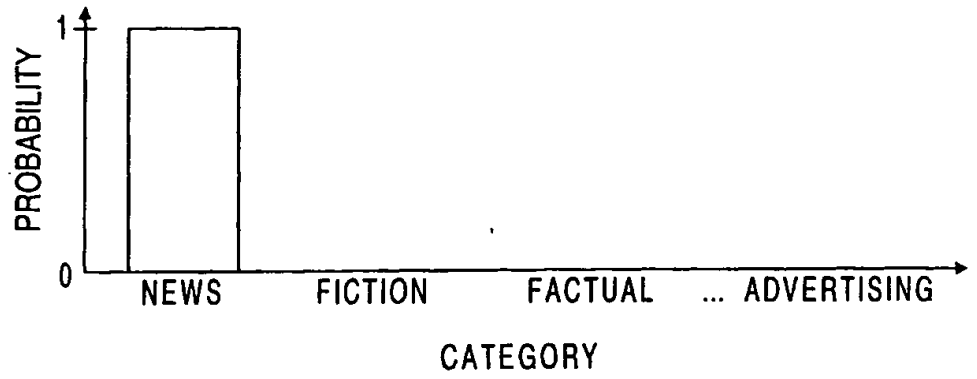


FIG. 9A

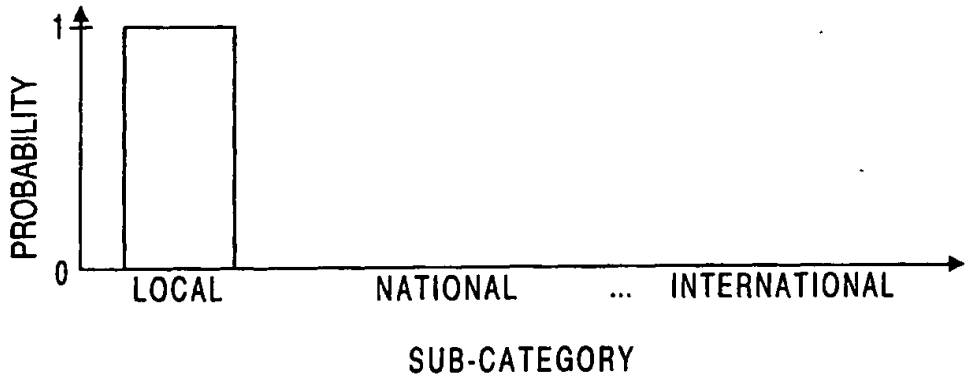


FIG. 9B

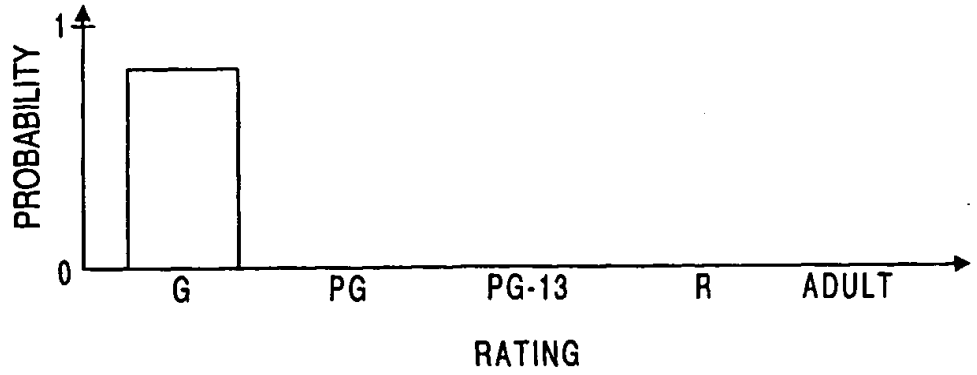


FIG. 9C

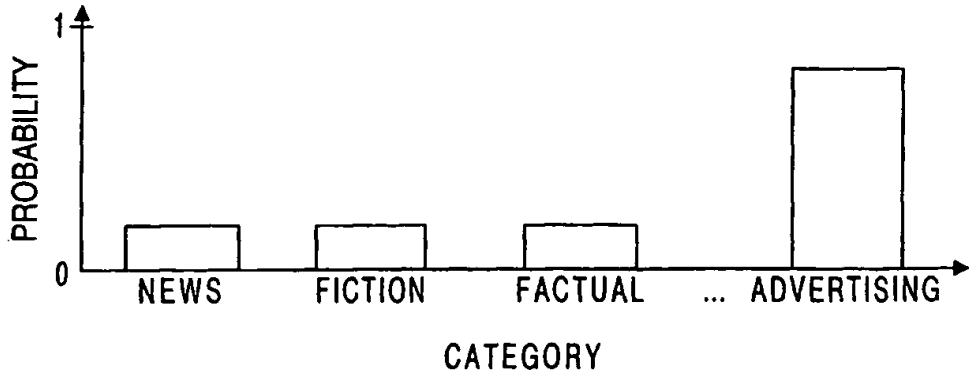


FIG. 9D

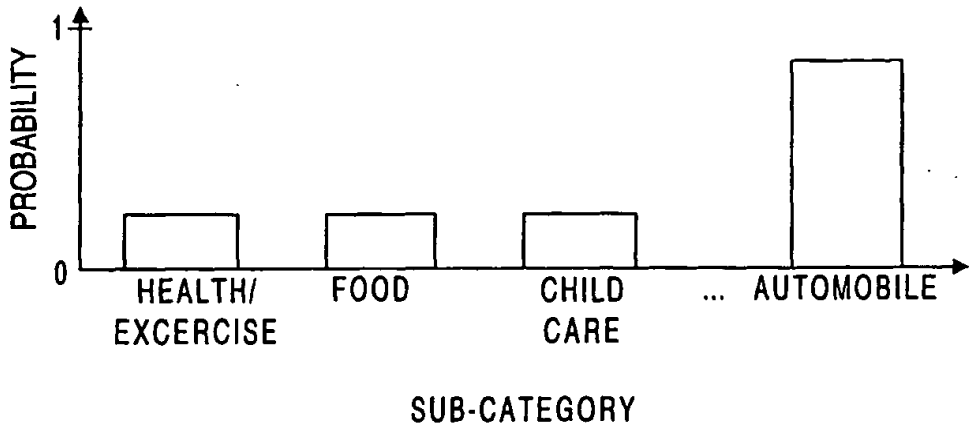


FIG. 9E

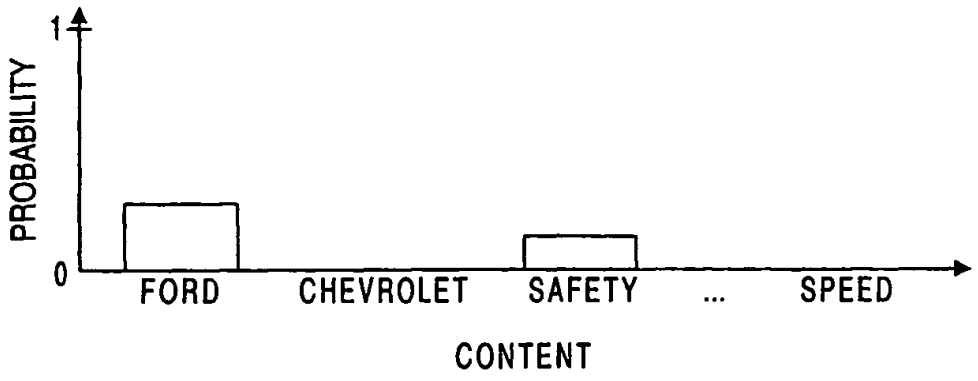


FIG. 9F

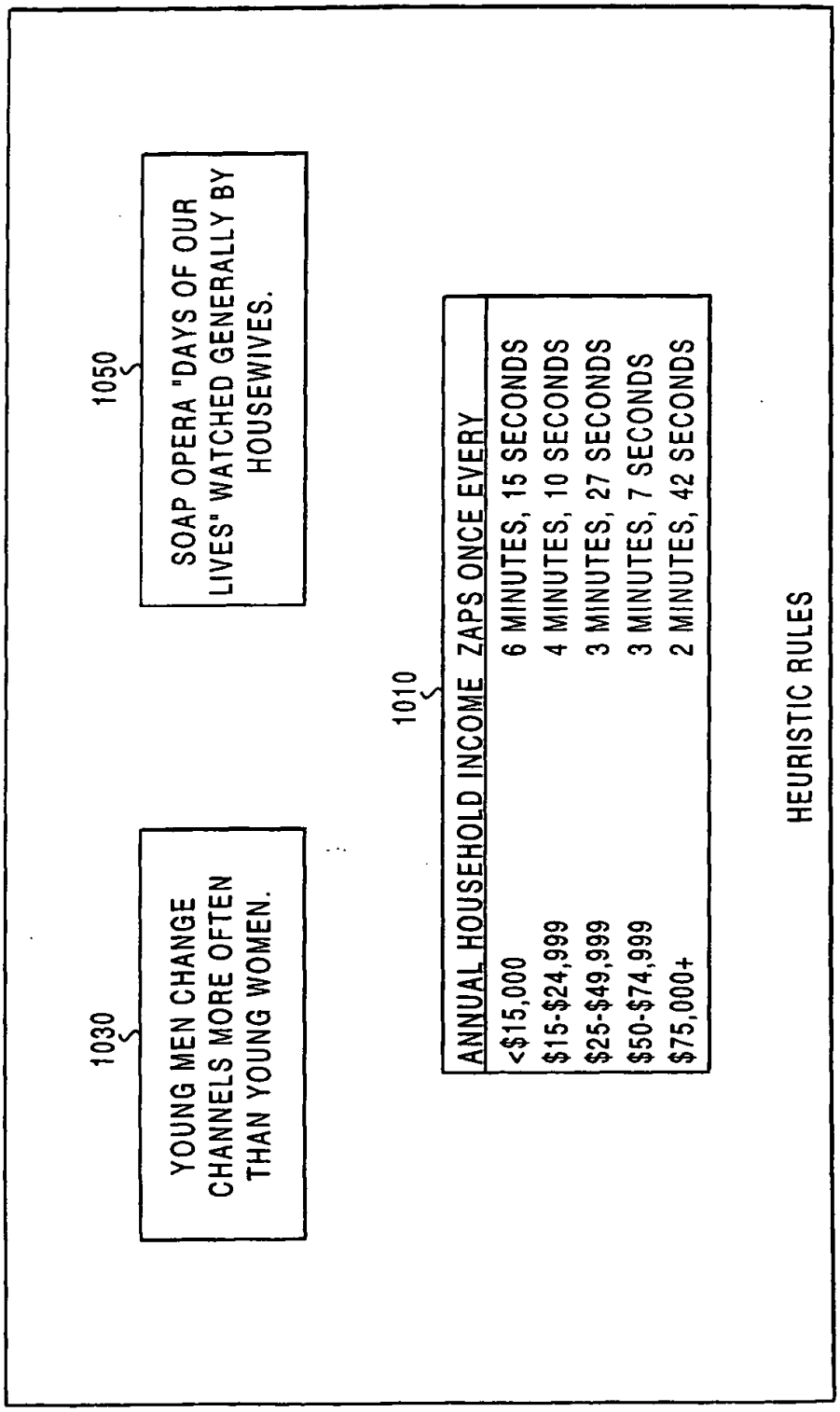

1030
YOUNG MEN CHANGE CHANNELS MORE OFTEN THAN YOUNG WOMEN.
1050
SOAP OPERA "DAYS OF OUR LIVES" WATCHED GENERALLY BY HOUSEWIVES.
1010
ANNUAL HOUSEHOLD INCOME ZAPS ONCE EVERY
<$15,000 6 MINUTES, 15 SECONDS
$15-$24,999 4 MINUTES, 10 SECONDS
$25-$49,999 3 MINUTES, 27 SECONDS
$50-$74,999 3 MINUTES, 7 SECONDS
$75,000+ 2 MINUTES, 42 SECONDS
HEURISTIC RULES

FIG. 10A

CATEGORIES	DEMOGRAPHIC GROUPS																			
	AGE				INCOME				SIZE				GENDER							
	0-10	10-18	...	>70	0-20K	20-50K	...	50-100K	1	2	...	>5	M	F						
NEWS	0.1	0.1		0.4	0.2	0.3		0.4	0.5	0.3		0.1	0.3	0.7						
FICTION	0.5	0.3		0.2	0.4	0.2		0.3	0.3	0.2		0.1	0.8	0.2						
FACTUAL	0.2	0.2		0.3	0.1	0.4		0.2	0.2	0.2		0.4	0.4	0.6						
⋮																				
ADVERTISING	0.1	0.3		0.5	0.3	0.2		0.1	0.2	0.1		0.3	0.5	0.5						

FIG. 10B

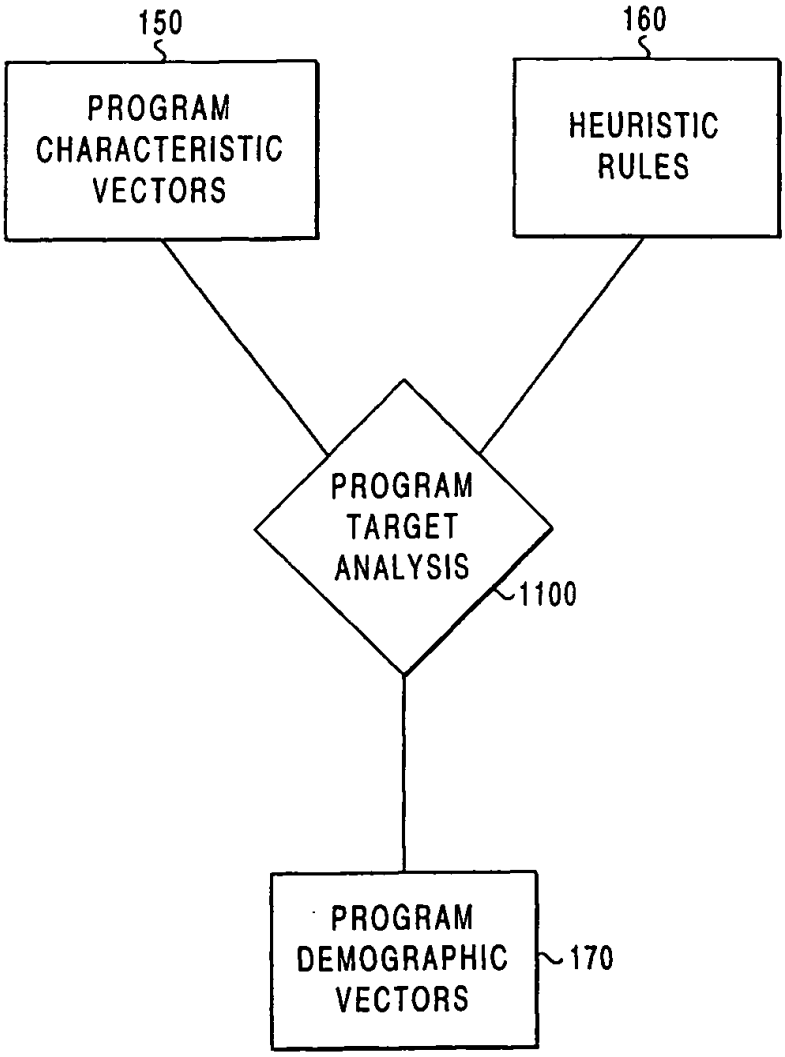

150
PROGRAM CHARACTERISTIC VECTORS
160
HEURISTIC RULES
PROGRAM TARGET ANALYSIS
1100
PROGRAM DEMOGRAPHIC VECTORS
170

FIG. 11

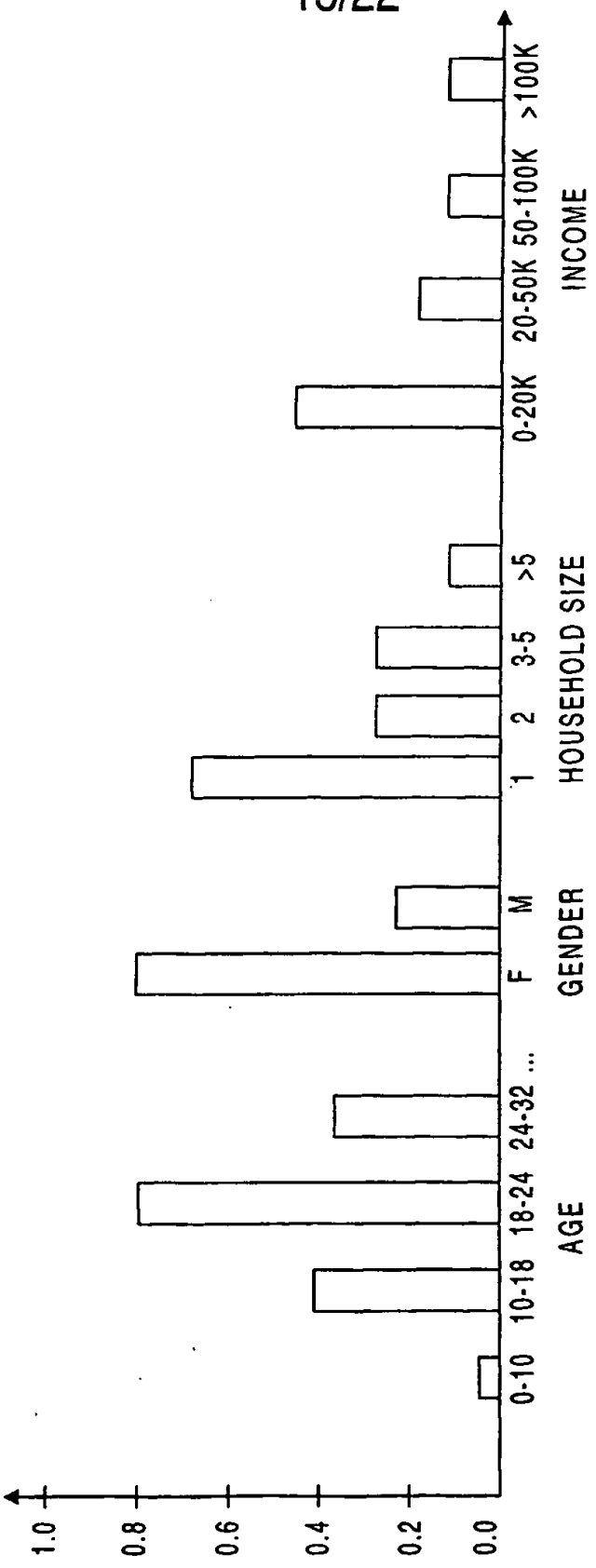

1.0
0.8
0.6
0.4
0.2
0.0
0-10
10-18
18-24
24-32 ...
AGE
F
M
GENDER
1
2
3-5
>5
HOUSEHOLD SIZE
0-20K
20-50K
50-100K
>100K
INCOME

FIG. 12

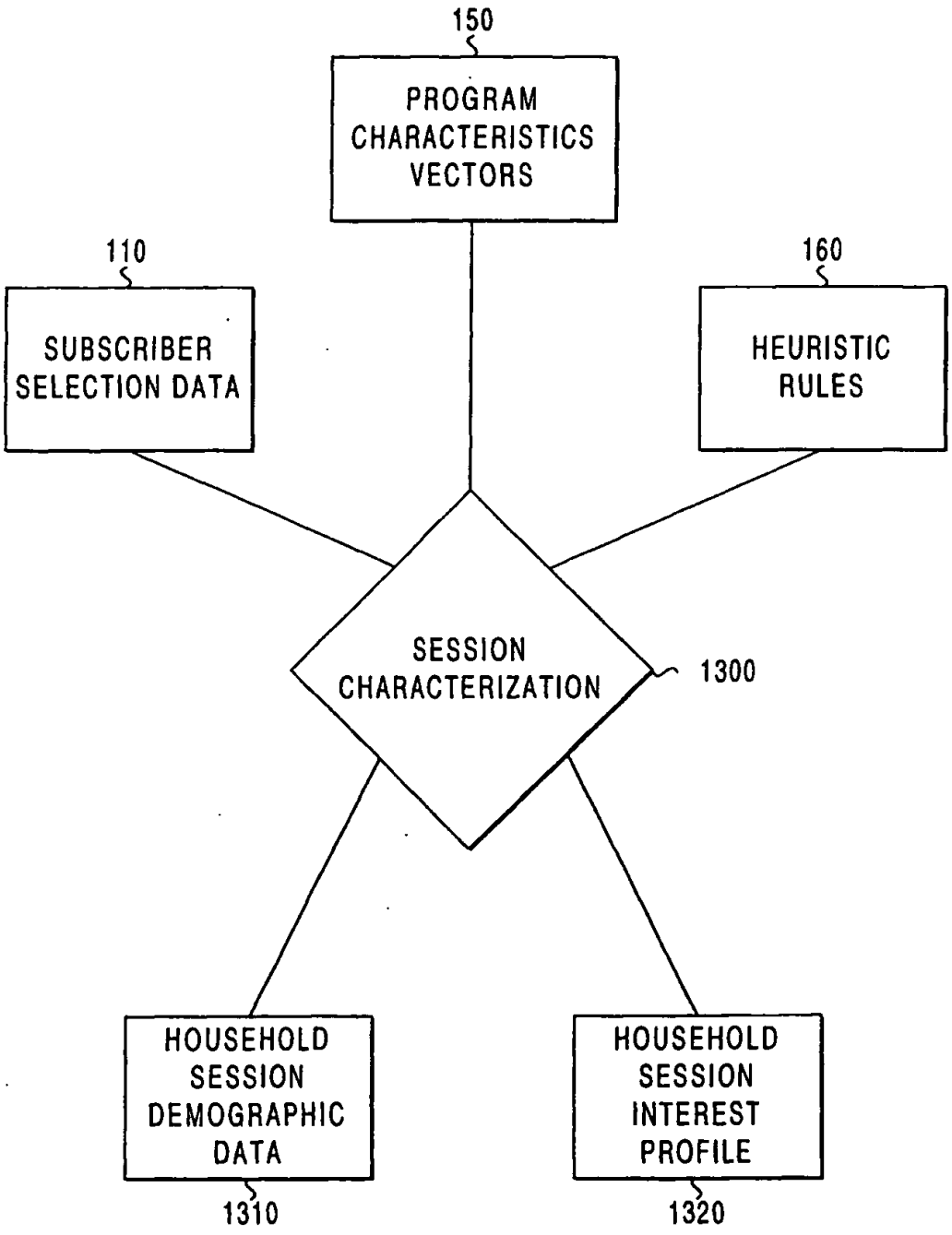

150
PROGRAM CHARACTERISTICS VECTORS
110
SUBSCRIBER SELECTION DATA
160
HEURISTIC RULES
SESSION CHARACTERIZATION
1300
HOUSEHOLD SESSION DEMOGRAPHIC DATA
1310
HOUSEHOLD SESSION INTEREST PROFILE
1320

FIG. 13

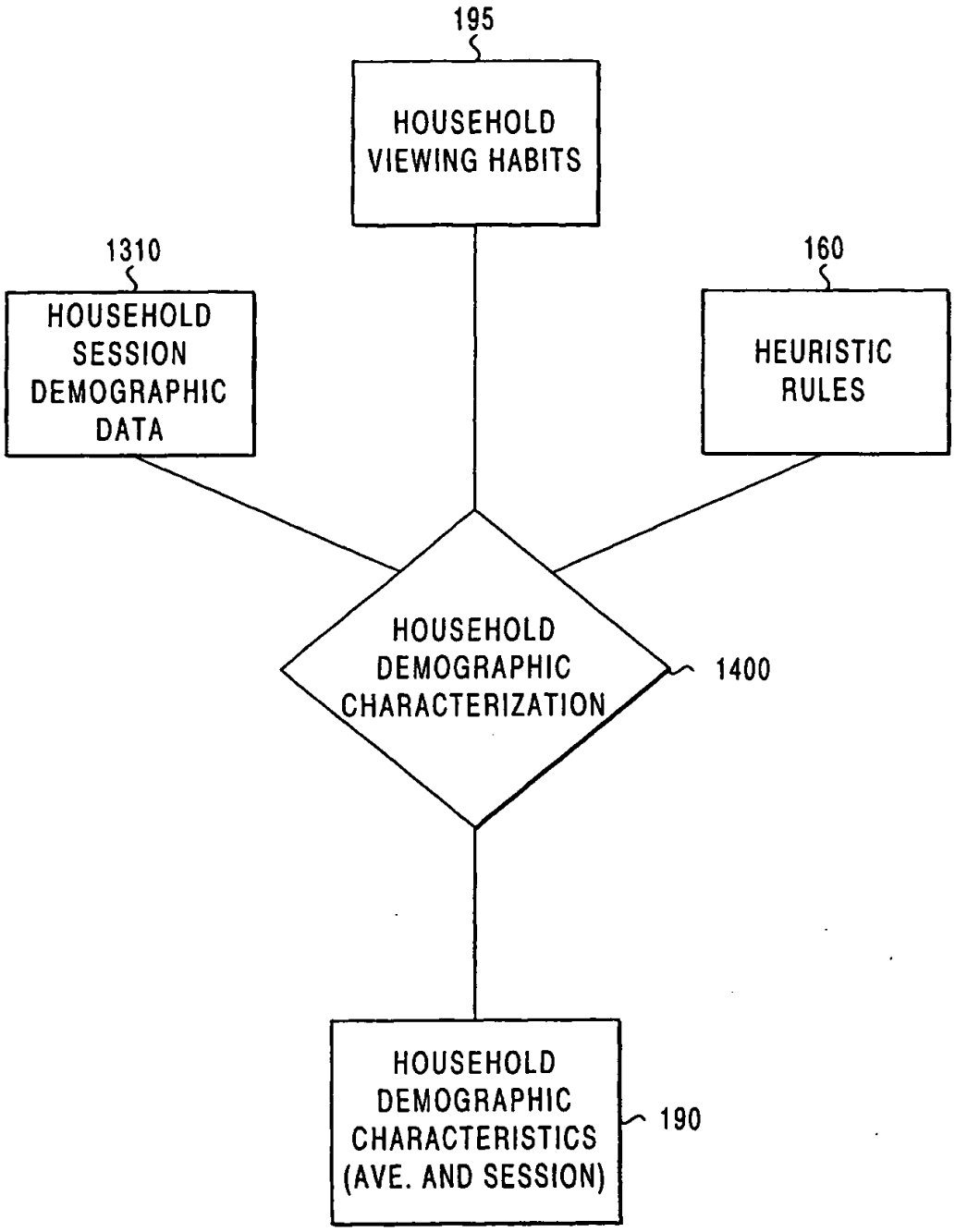

195
HOUSEHOLD VIEWING HABITS
1310
HOUSEHOLD SESSION DEMOGRAPHIC DATA
160
HEURISTIC RULES
HOUSEHOLD DEMOGRAPHIC CHARACTERIZATION
1400
HOUSEHOLD DEMOGRAPHIC CHARACTERISTICS (AVE. AND SESSION)
190

FIG. 14

1501 HOUSEHOLD PARAMETER	1505 AVERAGE VALUE	1503 SESSION VALUE	1507 UPDATE?
SIZE	2.6	3.0	YES
AGE	23.5	12	YES
SEX (FEMALE=1)	0.6	0.7	YES
INCOME ($0-$20K)	0.1	0.1	YES
INCOME ($20-$50K)	0.6	0.7	YES
INCOME ($50-$100K)	0.2	0.1	YES
INCOME (>$100K)	0.1	0.1	YES
ZIP CODE			NO
TELEPHONE NUMBER			NO

FIG. 15

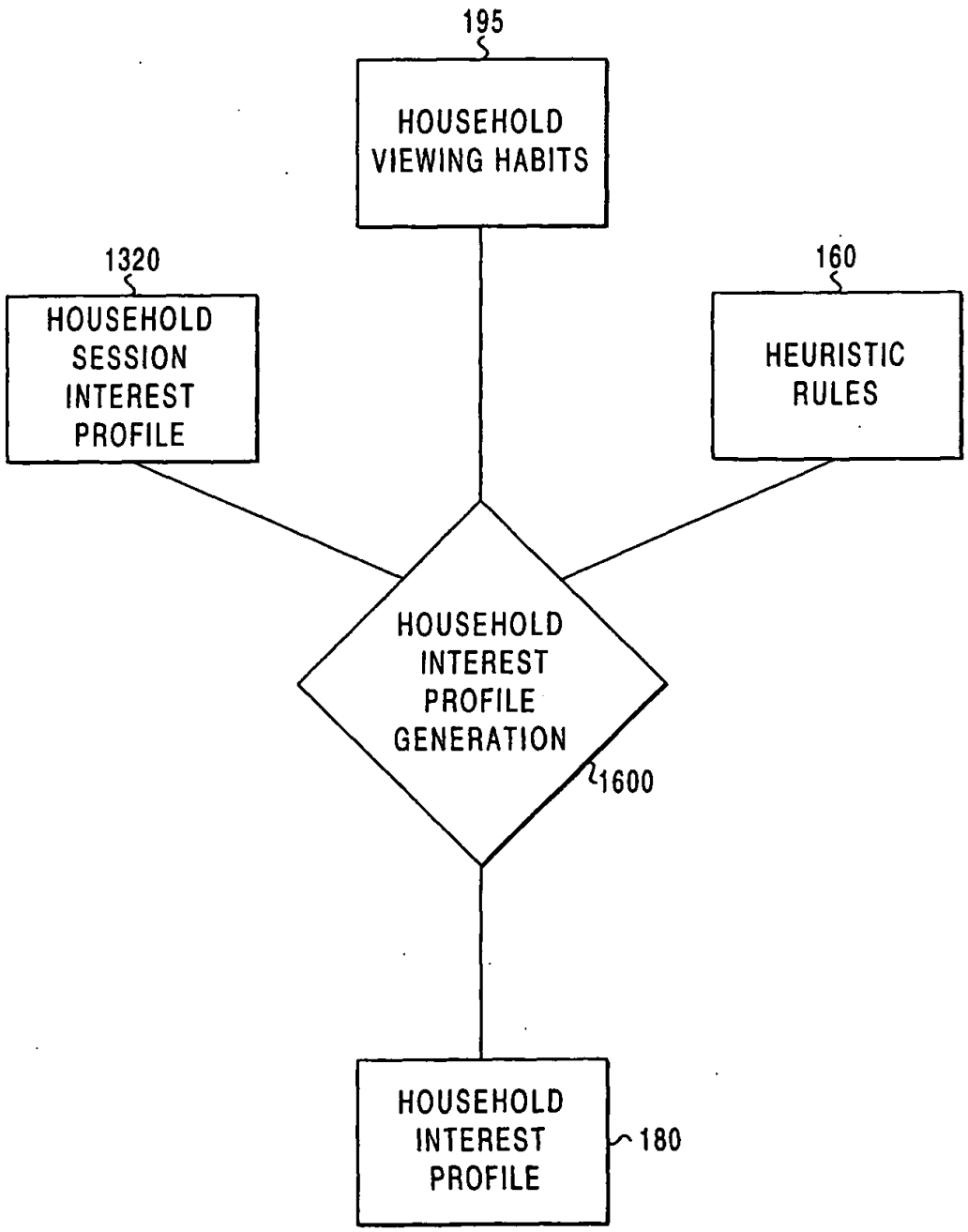

195
HOUSEHOLD VIEWING HABITS
1320
HOUSEHOLD SESSION INTEREST PROFILE
160
HEURISTIC RULES
HOUSEHOLD INTEREST PROFILE GENERATION
1600
HOUSEHOLD INTEREST PROFILE
180

FIG. 16

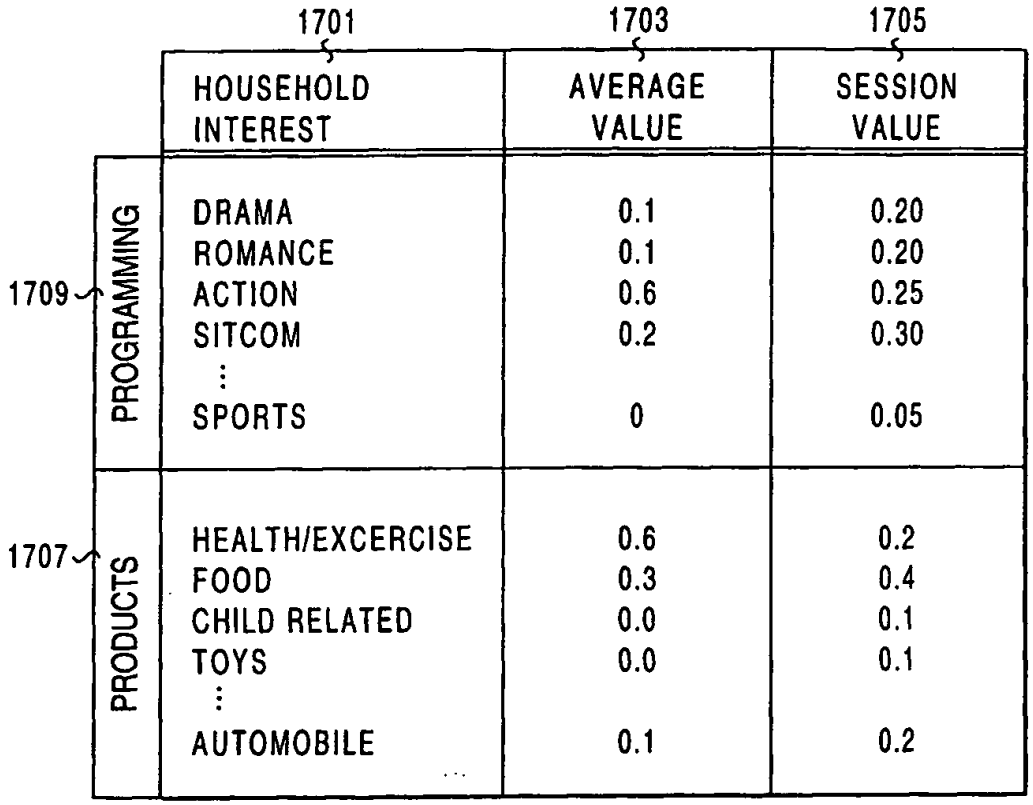

1701
1703
1705
HOUSEHOLD INTEREST
AVERAGE VALUE
SESSION VALUE
1709
PROGRAMMING
DRAMA 0.1 0.20
ROMANCE 0.1 0.20
ACTION 0.6 0.25
SITCOM 0.2 0.30
SPORTS 0 0.05
1707
PRODUCTS
HEALTH/EXCERCISE 0.6 0.2
FOOD 0.3 0.4
CHILD RELATED 0.0 0.1
TOYS 0.0 0.1
AUTOMOBILE 0.1 0.2

FIG. 17

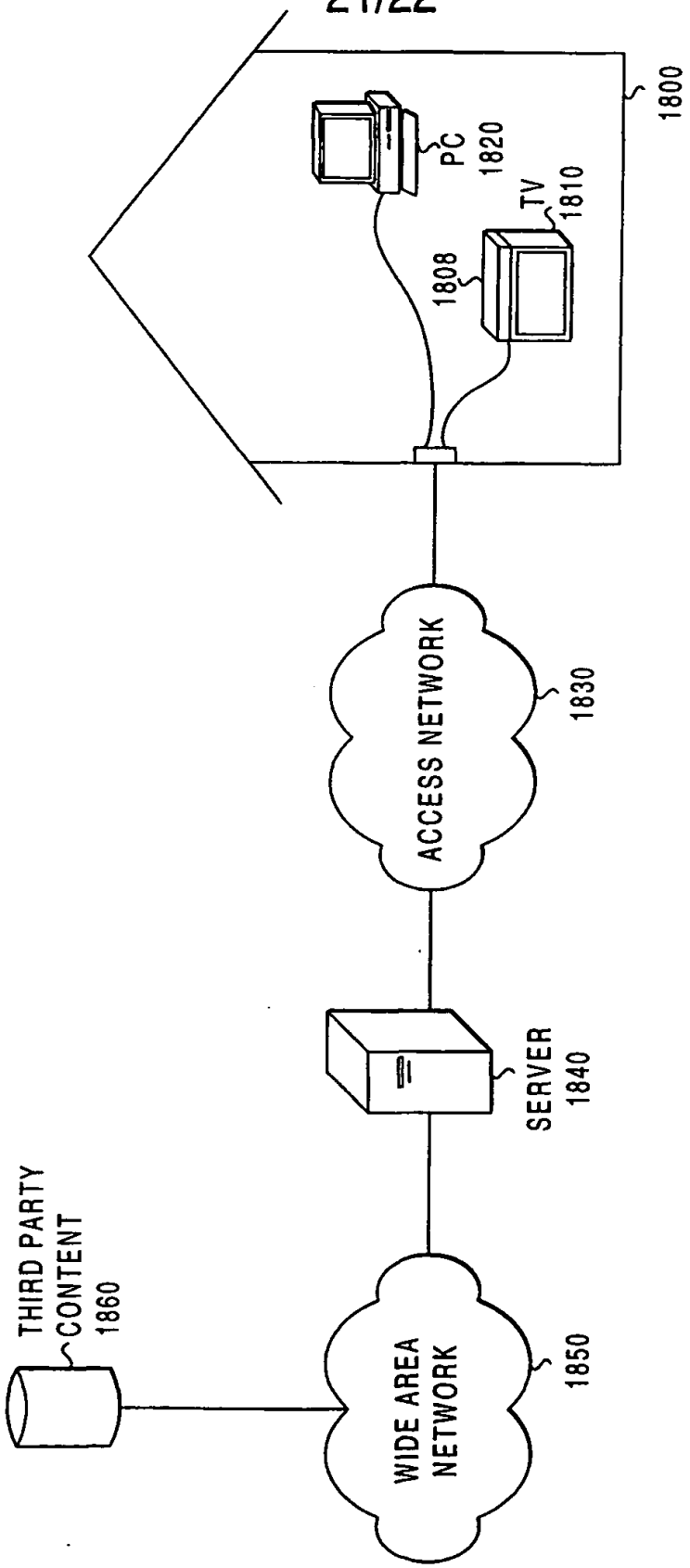

1800
PC
1820
TV
1810
1808
ACCESS NETWORK
1830
SERVER
1840
WIDE AREA
NETWORK
1850
THIRD PARTY
CONTENT
1860

FIG. 18

1915 ADID	1921 PRODUCT	1927 BRAND	1933 % WATCHED	1937 VOLUME
216	DIAPERS	HUGS	50%	6/10
1230	DETERGENT	SOAPY	90%	6/10
	⋮			
4137	AUTOMOBILES	SPEEDSTER	70%	8/10

FIG. 19

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
8 June 2000 (08.06.2000)

PCT

(10) International Publication Number
WO 00/33160 A3

(51) International Patent Classification[7]: H04N 7/173

(21) International Application Number: PCT/US99/28528

(22) International Filing Date: 2 December 1999 (02.12.1999)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

09/204,888	3 December 1998 (03.12.1998)	US
09/205,119	3 December 1998 (03.12.1998)	US
09/205,653	3 December 1998 (03.12.1998)	US

(71) Applicant *(for all designated States except US)*: **TELECOM PARTNERS LTD.** [US/US]; 300 N. Broad Street, Doylestown, PA 18901 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **ELDERING, Charles, A.** [US/US]; 315 Hedgerow Lane, Doylestown, PA 18901 (US). **SYLLA, M., Lamine** [SN/US]; 6 West Butler Avenue, New Britain, PA 18901 (US).

(74) Agents: **BLASKO, John, P.** et al.; J.P. Blasko Professional Corp., 107 North Broad Street, Doylestown, PA 18901 (US).

(81) Designated States *(national)*: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

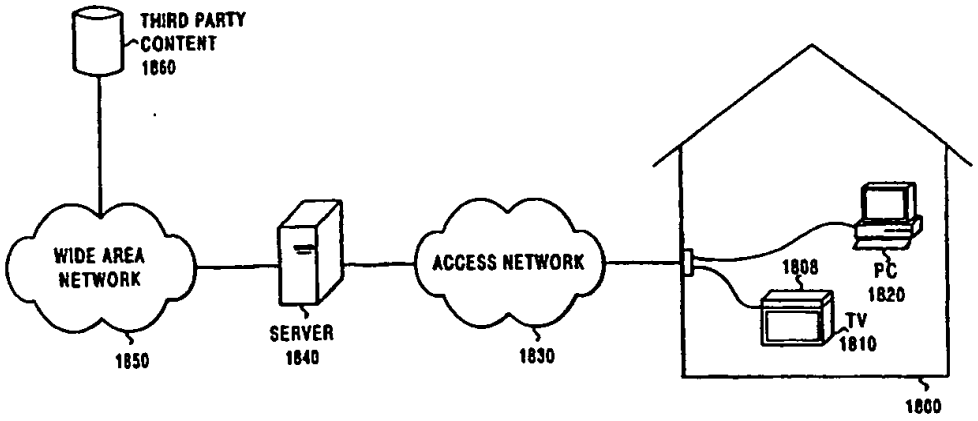
Published:
— *With international search report.*
— *With amended claims.*

(88) Date of publication of the international search report:
30 November 2000

Date of publication of the amended claims: 28 December 2000

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SUBSCRIBER CHARACTERIZATION AND ADVERTISEMENT MONITORING SYSTEM



(57) Abstract: A subscriber characterization and advertisement monitoring system is presented in which subscriber viewing habits are monitored to determine demographic profiles. These profiles can be utilized for the matching of advertisements to subscribers based on their viewing habits and estimated demographics and product interests. The system can be run locally in a television set-top (1808) or can be run in client server mode where channel selections are transmitted from the residence (1800) to a centralized switching location server (1840) such as a telephone office or Internet Service Provider. In client-server mode the channel selections are monitored at the centralized location (1840) which also performs the subscriber characterization. The system also provides the ability to monitor if advertisements were viewed and for what duration.

WO 00/33160 A3

52. A method for generating a subscriber profile for a subscribed user of television programming, the method comprising:

monitoring user viewing activities;

collecting subscriber selection data based on source material selected by the user over a predetermined period of time; and

processing the subscriber selection data to create a subscriber profile.

53. The method of claim 52, wherein the source material includes analog video, Motion Picture Expert Group, digital video, Hypertext MarkUp Language material, and other multimedia source material supplied to the user by a provider of the television programming.

54. The method of claim 52, wherein said monitoring user viewing activities includes monitoring volume control commands initiated by the user.

55. The method of claim 52, wherein said monitoring user viewing activities includes monitoring program selection commands initiated by the user.

56. The method of claim 55, wherein the program selection commands includes channel change signals.

57. The method of claim 55, wherein the program selection commands include address requests made by the user requesting delivery of programming from the provider of the television programming.

58. The method of claim 52, wherein said monitoring user viewing activities includes monitoring record signals initiated by the user.

59. The method of claim 52, wherein said collecting subscriber selection data includes extracting source related text from the source material.

60. The method of claim 59, wherein the source related text includes one or more descriptive fields.

61. The method of claim 59, wherein the source material is an electronic program guide and the source related text is extracted from the electronic program guide.

62. The method of claim 59, wherein the source material is at least one HTML file related to the source material and the source related text is extracted from the at least one HTML file.

63. The method of claim 59, wherein the source material includes close captioning information and the source related text is extracted from the close captioning information.

64. The method of claim 52, wherein said collecting subscriber selection data includes monitoring time durations, wherein the time durations correspond to viewing times of selected source material.

65. The method of claim 52, wherein said processing the subscriber selection data includes generating one or more program characteristics vectors based on the subscriber selection data.

66. The method of claim 65, wherein the program characteristics vectors include one or more values characterizing the source material.

67. The method of claim 52, wherein said processing the subscriber selection data includes generating a n-dimensional program characteristics matrix comprising one or more program characteristics vectors.

68. The method of claim 52, wherein said processing the subscriber selection data includes processing subscriber

selection data based on a pre-determined set of heuristic rules.

69. The method of claim 68, wherein the heuristic rules include logical forms.

70. The method of claim 68, wherein the heuristic rules include conditional probabilities.

71. The method of claim 52, wherein the subscriber profile is based on the users interests.

72. The method of claim 52, wherein the subscriber belongs to a household and the subscriber profile is based on the interests of the household.

73. The method of claim 52, wherein the subscriber profile is a demographic profile indicating the probable age, income, gender, and other demographics of the user.

74. The method of claim 52, wherein the predetermined period of time for collecting subscriber selection data is a viewing session, and the subscriber profile is a demographic profile for the user during the viewing session.

75. The method of claim 52, wherein the predetermined period of time for collecting subscriber selection data is a plurality of viewing sessions, and the subscriber profile is an average demographic profile for the user, wherein the average demographic profile is an average for the plurality of viewing sessions.

76. The method of claim 52, wherein the subscriber profile is a program preference profile indicating the type of programming of interest to the user.

77. The method of claim 52, wherein the subscriber profile is a product preference profile for the user.

78. The method of claim 52, wherein the subscriber belongs to a household and the subscriber profile includes probabilistic measurements of household demographics.

79. The method of claim 52, wherein the subscriber belongs to a household and the subscriber profile includes probabilistic measurements of household program interests.

80. The method of claim 52, wherein the subscriber belongs to a household and the subscriber profile includes probabilistic measurements of household product interests.

81. The method of claim 52, wherein the subscriber belongs to a household, the predetermined period of time for collecting subscriber selection data is a viewing session, and the subscriber profile is a demographic profile for the household during the viewing session.

82. The method of claim 52, wherein the subscriber belongs to a household, the predetermined period of time for collecting subscriber selection data is a plurality of viewing sessions, and the subscriber profile is an average demographic profile for the household, wherein the average demographic profile is an average for the plurality of viewing sessions.

83. The method of claim 52, wherein the subscriber profile is controlled by the user.

84. The method of claim 52, wherein the subscriber profile is analyzed by a third party for the purposes of marketing and advertising.

85. The method of claim 52, wherein access to the subscriber profile is limited to a select number of other parties.

86. The method of claim 52, further comprising analyzing the subscriber profile to estimate user viewing habits.

87. A data processing system for generating a subscriber profile for a subscribed user of television programming, the data processing system comprising:

means for processing data;

a storage medium;

means for monitoring subscriber activity including means for storing subscriber selection data, wherein the subscriber selection data corresponds to source material selected by a subscriber;

means for retrieving source related information which includes descriptive fields corresponding to the selected source material;

means for processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile; and

means for storing the subscriber profile.

88. The system described in claim 87, wherein the means for monitoring subscriber activity further includes means for monitoring viewing times of the selected source material.

89. The system described in claim 87, wherein the means for monitoring subscriber activity further includes means for monitoring volume control commands initiated by the subscriber.

90. The system described in claim 87, wherein the subscriber profile includes probabilistic measurements of household demographics.

91. The system described in claim 87, wherein the subscriber profile includes probabilistic measurements of household program interests.

92. The system described in claim 87, wherein the subscriber profile includes probabilistic measurements of household product interests.

93. The system described in claim 87, wherein the means for retrieving source related information includes means for context mining of textual information associated with the selected source material.

94. The system described in claim 93, wherein the textual information is text derived from closed-captioning data.

95. The system described in claim 87, wherein the means for retrieving source related information includes means for retrieving information associated with the selected source material from an electronic program guide.

96. The system described in claim 87, wherein the means for processing the subscriber selection data processes the data over a viewing session so that the subscriber profile corresponds to the viewing session.

97. The system described in claim 87, wherein the means for processing the subscriber selection data includes processing the subscriber selection data over multiple viewing sessions to generate an average subscriber profile which is an average of the subscriber profiles for each viewing session.

98. A data processing system for generating a subscriber profile vector for a subscribed user of television programming, the data processing system comprising:

means for processing data;

a storage medium;

means for monitoring subscriber activity including means for storing subscriber selection data, wherein the subscriber selection data corresponds to source material selected by the user;

means for retrieving source related information including descriptive fields corresponding to the selected source material;

means for generating a program characteristics vector based on the source related information;

means for storing a set of heuristic rules;

means for processing the subscriber selection data with respect to the program characteristics vector and the set of heuristic rules to generate the subscriber profile vector; and

means for storing the subscriber profile vector.

99. The system described in claim 98, wherein the means for monitoring subscriber activity further includes means for monitoring viewing times of the selected source material.

100. The system described in claim 98, wherein the means for monitoring subscriber activity further includes means for monitoring subscriber selection volume levels.

101. The system described in claim 98, wherein the subscriber profile vector includes probabilistic measurements of household demographics.

102. The system described in claim 98, wherein the subscriber profile includes probabilistic measurements of household interests.

103. A data processing system for generating a household demographic characteristics vector, the data processing system comprising:

means for processing data;

a storage medium;

means for monitoring subscriber activity including means for storing subscriber selection data, wherein the subscriber selection data corresponds to selected source material;

means for generating household viewing habits from the subscriber selection data;

means for storing a set of heuristic rules;

means for processing the subscriber selection data with respect to the set of heuristic rules to generate the household demographic characteristics vector; and

means for storing the household demographic characteristics vector.

104. The system described in claim 103, wherein the means for processing the subscriber selection data includes processing information over a viewing session, and the household demographic characteristics vector corresponds to the viewing session.

105. The system described in claim 103, wherein the means for processing the subscriber selection data includes processing the subscriber selection data over multiple viewing sessions to generate an average household demographic characteristics vector which is an average of the household demographic characteristic vectors for each viewing session.

106. An interactive television system comprising

a input device for allowing a subscriber to select source material to view;

a monitor for displaying the selected source material; and

a profile generator for generating a profile of the subscriber based on source material viewed.

107. The system of claim 106, wherein the profile generator includes:

means for monitoring subscriber activity;

means for retrieving source related information corresponding to the selected source material; and

means for generating a subscriber profile based on the subscriber activity and the source related information.

108. The system of claim 106, wherein the profile generator includes:

means for monitoring subscriber activity;

means for retrieving source related information corresponding to the selected source material;

means for generating a content characteristics vector based on the source related information; and

means for generating a subscriber profile based on the subscriber activity, the content characteristics vector, and a set of heuristic rules.

109. The system of claim 106, wherein the profile generator includes:

means for monitoring subscriber activity;

means for generating a viewing habits profile from the subscriber activity; and

means for generating a subscriber profile based on the viewing habits profile and a set of heuristic rules.

110. A method for monitoring advertisements watched by a subscriber, the method comprising:

monitoring subscriber advertising viewing activities;

retrieving advertising related information including descriptive fields corresponding to an advertisement;

determining the extent to which the advertisement is viewed by the subscriber; and

recording the determination.

111. The method of claim 110, further comprising generating a subscriber profile based on at least one recorded determination.

112. The method of claim 111, wherein the subscriber profile is a subscriber product interests profile.

113. The method of claim 110, wherein said monitoring subscriber advertising includes monitoring volume control commands initiated by the subscriber.

114. The method of claim 110, wherein said monitoring subscriber advertising includes monitoring channel change signals initiated by the subscriber.

115. The method of claim 110, wherein said retrieving advertising related information includes extracting source related text from source material for the advertisement.

116. The method of claim 115, wherein the source related text includes at least one descriptive field.

117. The method of claim 115, wherein the source related text is extracted from an electronic program guide.

118. The method of claim 115, wherein the source related text is extracted from at least one HTML file related to the source material.

119. The method of claim 115, wherein the source related text is extracted from the closed-captioning information.

120. The method of claim 115, wherein the source related text extracted from source material includes a product name field.

121. The method of claim 115, wherein the source related text extracted from source material includes a product brand field.

122. The method of claim 115, further comprising generating at least one advertising characteristic based on the extracted source related text.

123. The method of claim 115, further comprising generating at least one advertising characteristic based on at least one value characterizing the source material

124. The method of claim 122, wherein the at least one advertising characteristic includes an n-dimensional characteristics matrix.

125. A data processing system for monitoring advertisements watched by a subscriber, the data processing system comprising:

means for monitoring subscriber activity including means for storing subscriber selections;

means for retrieving advertisement related information including descriptive fields corresponding to an advertisement;

means for processing information including means for determining the extent to which an advertisement is viewed by the subscriber; and

means for storing the descriptive fields and the determination of the extent to which the advertisement is viewed by the subscriber.

126. The system described in claim 125, wherein the means for monitoring subscriber activity further includes means for monitoring subscriber selection volume levels.

127. The system described in claim 125, further comprising:

means for determining a subscriber product interests profile; and

means for storing the subscriber product interests profile.

128. The system described in claim 125, wherein the means for retrieving advertisement related information includes means for context mining of textual information associated with source material of the advertisement.

129. The system described in claim 128, wherein the textual information is text derived from closed-captioning data.

130. The system described in claim 128, wherein the textual information includes a product name field.

131. The system described in claim 128, wherein the textual information includes a product brand field.

132. A client-server based data processing system for monitoring advertisements watched by a subscriber, the client-server based data processing system comprising:

means for transmitting subscriber channel change requests;

means for monitoring subscriber activity including:

means for receiving subscriber channel change requests;

means for storing the subscriber channel change requests;

means for retrieving advertisement related information, wherein the advertisement related information contains descriptive fields corresponding to an advertisement;

means for determining the extent to which an advertisement is viewed by the subscriber; and

means for storing the descriptive fields and the determination of the extent to which the advertisement is viewed by the subscriber.

133. The system described in claim 132, further comprising:

means for determining a subscriber product interests profile; and

means for storing the subscriber product interests profile.

134. An interactive television system comprising:

an input device for allowing a subscriber to select source material to view;

a monitor for displaying the selected source material; and

an advertisement monitoring device.

135. The system of claim 134, wherein the advertisement monitoring device includes:

means for monitoring subscriber activity including subscriber selections;

means for retrieving advertisement related information corresponding to an advertisement; and

means for determining the extent to which an advertisement is viewed by the subscriber.

136. The system of claim 134, further including a profile generator.

137. The system of claim 136, wherein the profile generator generates a subscriber interest profile based on advertisements that the subscriber views.

138. In a client-server based architecture having a client side and a server side, a method for generating a subscriber profile vector for a subscriber, the method comprising:

monitoring subscriber viewing activities including capturing requests for source material initiated by the client side;

generating subscriber selection data, wherein the subscriber selection data corresponds to a record of requests for the source material;

retrieving source related information, wherein the source related information includes descriptive fields corresponding to the source material;

processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile vector; and

storing the subscriber profile vector.

139. The method of claim 138, wherein said monitoring subscriber viewing activities includes monitoring time durations corresponding to the viewing times of the requested source material.

140. The method of claim 138, wherein said monitoring subscriber viewing activities includes monitoring volume levels corresponding to subscriber selection volume levels.

141. The method of claim 138, wherein the subscriber profile vector includes household demographic data indicating probabilistic measurements of household demographics.

142. The method of claim 138, wherein the subscriber profile vector includes household program preference information indicating probabilistic measurements of household program interests.

143. The method of claim 138, wherein the subscriber profile vector includes household product preference information indicating probabilistic measurements of household product interests.

144. The method of claim 138, wherein said generating subscriber selection data includes context mining of textual information associated with the selected source material.

145. The method of claim 144, wherein the textual information includes text derived from closed-captioning data.

146. The method of claim 138, wherein said retrieving source related information includes retrieving source related information from an electronic program guide associated with the selected source material.

147. The method of claim 138, wherein said generating subscriber selection data includes generating subscriber selection data over a viewing session, and the subscriber profile vector corresponds to the viewing session.

148. The method described in claim 138, wherein said generating subscriber selection data includes generating subscriber selection data over multiple viewing sessions, and the subscriber profile vector corresponds to an average value for the multiple viewing sessions.

149. A data processing system for generating a subscriber profile vector in a client-server based architecture, the data processing system comprising:

means for transmitting a subscriber request for source material;

means for monitoring subscriber activity including

means for receiving the subscriber request for source material;

means for recording the requests for source material as subscriber selection data;

means for retrieving source related information, wherein the source related information includes descriptive fields corresponding to the source material;

means for generating a program characteristics vector based on the source related information;

means for storing a set of heuristic rules;

means for processing the subscriber selection data with respect to the program characteristics vector and the set of heuristic rules to generate the subscriber profile vector; and

means for storing the subscriber profile vector.

150. The system described in claim 149, wherein the means for monitoring subscriber activity further includes means for monitoring time durations, wherein the time durations correspond to viewing times of the requested source material.

151. The system described in claim 149, wherein the means for monitoring subscriber activity further includes means for monitoring volume levels, wherein the volume levels correspond to subscriber selection volume levels.

152. The system described in claim 149, wherein the subscriber profile vector includes household demographic data indicating probabilistic measurements of household demographics.

153. The system described in claim 149, wherein the subscriber profile vector includes a household session interest profile indicating probabilistic measurements of household interests.

154. A data processing system for generating a household demographic characteristics vector in a client-server based architecture, the data processing system comprising:

means for allowing a subscriber to request source material;

means for monitoring subscriber activity including means for storing subscriber selection data, wherein the subscriber selection data corresponds to requested source material;

means for generating household viewing habits information from the subscriber selection data;

means for storing a set of heuristic rules;

means for processing the subscriber selection data with respect to the set of heuristic rules to generate the household demographic characteristics vector; and

means for storing the household demographic characteristics vector.

155. The system described in claim 154, wherein the means for processing the subscriber selection data processes the subscriber selection data over a viewing session, and the

generated household demographic characteristics vector corresponds to the viewing session.

156. The system described in claim 154, wherein the means for processing the subscriber selection data processes the subscriber selection data over a period of multiple viewing sessions, and the generated household demographic characteristics vector corresponds to an average value for the multiple viewing sessions.

157. A data processing system for generating a subscriber profile vector in a client-server based architecture, the data processing system comprising:

means for selecting source material for a subscriber to view;

means for monitoring subscriber activity including

means for receiving the subscriber selections for source material;

means for recording the subscriber selections for source material, wherein a record of the selections constitutes subscriber selection data;

means for retrieving source related information, wherein the source related information includes descriptive fields corresponding to the source material;

means for processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile vector; and

means for storing the subscriber profile vector.

158. The system described in claim 157, wherein the subscriber profile vector includes household demographic data indicating probabilistic measurements of household demographics.

159. The system described in claim 157, wherein the subscriber profile vector includes household program preference information indicating probabilistic measurements of household program interests.

160. The system described in claim 157, wherein the subscriber profile vector contains household product preference information indicating probabilistic measurements of household product interests.

161. The system described in claim 157, wherein the means for retrieving source related information includes means for context mining of textual information associated with the selected source material.

162. The system described in claim 161, wherein the textual information is text derived from closed-captioning data.

163. The system described in claim 157, wherein the means for retrieving source related information retrieves source related information from an electronic program guide associated with the selected source material.

164. The system described in claim 154, wherein the means for processing the subscriber selection data processes the subscriber selection data over a viewing session, and the generated household demographic characteristics vector corresponds to the viewing session.

165. The system described in claim 154, wherein the means for processing the subscriber selection data processes the subscriber selection data over a period of multiple viewing sessions, and the generated household demographic characteristics vector corresponds to an average value for the multiple viewing sessions.

166. An Internet browsing system comprising:

a input device for allowing a subscriber to select source material to view;

a monitor for displaying the selected source material; and

a profile generator for generating a profile of the subscriber based on source material viewed.

167. The system of claim 166, wherein the profile generator includes:

means for tracking the subscriber selections for source material;

means for the retrieving the source material;

means for generating a content characteristics vector based on the source material; and

means for processing the subscriber selections with respect to the content characteristics vector and a set of heuristic rules to generate a subscriber profile.

168. The system of claim 166, wherein the profile generator includes:

means for monitoring subscriber activity;

means for generating viewing habits information from the subscriber activity; and

means for generating a viewer characteristics profile based on the viewing habits information and a set of heuristic rules.

169. The system of claim 166, wherein the profile generator includes:

means for monitoring subscriber activity including recording subscriber selections for source material;

means for retrieving the source material; and

means for generating a subscriber profile based on the subscriber selections and the source material.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/28528

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :H04N 7/173

US CL :345/327; 348/1,7,9,12,13; 455/2,4.2, 5.1,6.2,6.3

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/327; 348/1,7,9,12,13; 455/2,4.2, 5.1,6.2,6.3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, 5,374,951 A (WELSH) 20 December 1994 figure 7 & columns 14-15.	1
A, P	US 5,977,964 A (WILLIAMS et al.) 02 November 1999 whole document	1-7
A	US 5,786,845 A (TSURIA) 28 July 1998 whole document	8-13
A	US 5,233,423 A (JERNIGAN et al.) 03 August 1993 whole document	8-13
A	US 5,805,974 A (HITE et al.) 08 September 1998 whole document	8-13

[X] Further documents are listed in the continuation of Box C. [] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 16 JUNE 2000	Date of mailing of the international search report 01 AUG 2000
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer CHRISTOPHER GRANT Telephone No. (703) 305-4755

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/28528

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 5,758,259 A (LAWLER) 26 May 1998 figures 5 & 6.	14,15,22 33,34,40 ---------- 30-32, 49-51
X	US 5,635,989 A (ROTHMULLER) 03 June 1997 figure 3	14,22
X	US 5,410,344 A (GRAVES et al.) 25 April 1995 whole doucument, especially figure 4.	14,16-18, 22,23
A,E ---- Y,E	US 6,002,394 A (SCHEIN et al.) 14 December 1999 col. 15, line 58 - col. 16, line 14.	25-29,44-48 ---------- 30-32,49-51
A	US 5,515,098 A (CARLES) 07 May 1996 whole document	30-32,49-51

52. A method for generating a subscriber profile for a subscribed user of television programming, the method comprising:

monitoring user viewing activities;

collecting subscriber selection data based on source material selected by the user over a predetermined period of time; and

processing the subscriber selection data to create a subscriber profile.

53. The method of claim 52, wherein the source material includes analog video, Motion Picture Expert Group, digital video, Hypertext MarkUp Language material, and other multimedia source material supplied to the user by a provider of the television programming.

54. The method of claim 52, wherein said monitoring user viewing activities includes monitoring volume control commands initiated by the user.

55. The method of claim 52, wherein said monitoring user viewing activities includes monitoring program selection commands initiated by the user.

56. The method of claim 55, wherein the program selection commands includes channel change signals.

57. The method of claim 55, wherein the program selection commands include address requests made by the user requesting delivery of programming from the provider of the television programming.

58. The method of claim 52, wherein said monitoring user viewing activities includes monitoring record signals initiated by the user.

59. The method of claim 52, wherein said collecting subscriber selection data includes extracting source related text from the source material.

60. The method of claim 59, wherein the source related text includes one or more descriptive fields.

61. The method of claim 59, wherein the source material is an electronic program guide and the source related text is extracted from the electronic program guide.

62. The method of claim 59, wherein the source material is at least one HTML file related to the source material and the source related text is extracted from the at least one HTML file.

63. The method of claim 59, wherein the source material includes close captioning information and the source related text is extracted from the close captioning information.

64. The method of claim 52, wherein said collecting subscriber selection data includes monitoring time durations, wherein the time durations correspond to viewing times of selected source material.

65. The method of claim 52, wherein said processing the subscriber selection data includes generating one or more program characteristics vectors based on the subscriber selection data.

66. The method of claim 65, wherein the program characteristics vectors include one or more values characterizing the source material.

67. The method of claim 52, wherein said processing the subscriber selection data includes generating a n-dimensional program characteristics matrix comprising one or more program characteristics vectors.

68. The method of claim 52, wherein said processing the subscriber selection data includes processing subscriber

selection data based on a pre-determined set of heuristic rules.

69. The method of claim 68, wherein the heuristic rules include logical forms.

70. The method of claim 68, wherein the heuristic rules include conditional probabilities.

71. The method of claim 52, wherein the subscriber profile is based on the users interests.

72. The method of claim 52, wherein the subscriber belongs to a household and the subscriber profile is based on the interests of the household.

73. The method of claim 52, wherein the subscriber profile is a demographic profile indicating the probable age, income, gender, and other demographics of the user.

74. The method of claim 52, wherein the predetermined period of time for collecting subscriber selection data is a viewing session, and the subscriber profile is a demographic profile for the user during the viewing session.

75. The method of claim 52, wherein the predetermined period of time for collecting subscriber selection data is a plurality of viewing sessions, and the subscriber profile is an average demographic profile for the user, wherein the average demographic profile is an average for the plurality of viewing sessions.

76. The method of claim 52, wherein the subscriber profile is a program preference profile indicating the type of programming of interest to the user.

77. The method of claim 52, wherein the subscriber profile is a product preference profile for the user.

78. The method of claim 52, wherein the subscriber belongs to a household and the subscriber profile includes probabilistic measurements of household demographics.

79. The method of claim 52, wherein the subscriber belongs to a household and the subscriber profile includes probabilistic measurements of household program interests.

80. The method of claim 52, wherein the subscriber belongs to a household and the subscriber profile includes probabilistic measurements of household product interests.

81. The method of claim 52, wherein the subscriber belongs to a household, the predetermined period of time for collecting subscriber selection data is a viewing session, and the subscriber profile is a demographic profile for the household during the viewing session.

82. The method of claim 52, wherein the subscriber belongs to a household, the predetermined period of time for collecting subscriber selection data is a plurality of viewing sessions, and the subscriber profile is an average demographic profile for the household, wherein the average demographic profile is an average for the plurality of viewing sessions.

83. The method of claim 52, wherein the subscriber profile is controlled by the user.

84. The method of claim 52, wherein the subscriber profile is analyzed by a third party for the purposes of marketing and advertising.

85. The method of claim 52, wherein access to the subscriber profile is limited to a select number of other parties.

86. The method of claim 52, further comprising analyzing the subscriber profile to estimate user viewing habits.

87. A data processing system for generating a subscriber profile for a subscribed user of television programming, the data processing system comprising:

means for processing data;

a storage medium;

means for monitoring subscriber activity including means for storing subscriber selection data, wherein the subscriber selection data corresponds to source material selected by a subscriber;

means for retrieving source related information which includes descriptive fields corresponding to the selected source material;

means for processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile; and

means for storing the subscriber profile.

88. The system described in claim 87, wherein the means for monitoring subscriber activity further includes means for monitoring viewing times of the selected source material.

89. The system described in claim 87, wherein the means for monitoring subscriber activity further includes means for monitoring volume control commands initiated by the subscriber.

90. The system described in claim 87, wherein the subscriber profile includes probabilistic measurements of household demographics.

91. The system described in claim 87, wherein the subscriber profile includes probabilistic measurements of household program interests.

92. The system described in claim 87, wherein the subscriber profile includes probabilistic measurements of household product interests.

93. The system described in claim 87, wherein the means for retrieving source related information includes means for context mining of textual information associated with the selected source material.

94. The system described in claim 93, wherein the textual information is text derived from closed-captioning data.

95. The system described in claim 87, wherein the means for retrieving source related information includes means for retrieving information associated with the selected source material from an electronic program guide.

96. The system described in claim 87, wherein the means for processing the subscriber selection data processes the data over a viewing session so that the subscriber profile corresponds to the viewing session.

97. The system described in claim 87, wherein the means for processing the subscriber selection data includes processing the subscriber selection data over multiple viewing sessions to generate an average subscriber profile which is an average of the subscriber profiles for each viewing session.

98. A data processing system for generating a subscriber profile vector for a subscribed user of television programming, the data processing system comprising:

means for processing data;

a storage medium;

means for monitoring subscriber activity including means for storing subscriber selection data, wherein the subscriber selection data corresponds to source material selected by the user;

means for retrieving source related information including descriptive fields corresponding to the selected source material;

means for generating a program characteristics vector based on the source related information;

means for storing a set of heuristic rules;

means for processing the subscriber selection data with respect to the program characteristics vector and the set of heuristic rules to generate the subscriber profile vector; and

means for storing the subscriber profile vector.

99. The system described in claim 98, wherein the means for monitoring subscriber activity further includes means for monitoring viewing times of the selected source material.

100. The system described in claim 98, wherein the means for monitoring subscriber activity further includes means for monitoring subscriber selection volume levels.

101. The system described in claim 98, wherein the subscriber profile vector includes probabilistic measurements of household demographics.

102. The system described in claim 98, wherein the subscriber profile includes probabilistic measurements of household interests.

103. A data processing system for generating a household demographic characteristics vector, the data processing system comprising:

means for processing data;

a storage medium;

means for monitoring subscriber activity including means for storing subscriber selection data, wherein the subscriber selection data corresponds to selected source material;

means for generating household viewing habits from the subscriber selection data;

means for storing a set of heuristic rules;

means for processing the subscriber selection data with respect to the set of heuristic rules to generate the household demographic characteristics vector; and

means for storing the household demographic characteristics vector.

104. The system described in claim 103, wherein the means for processing the subscriber selection data includes processing information over a viewing session, and the household demographic characteristics vector corresponds to the viewing session.

105. The system described in claim 103, wherein the means for processing the subscriber selection data includes processing the subscriber selection data over multiple viewing sessions to generate an average household demographic characteristics vector which is an average of the household demographic characteristic vectors for each viewing session.

106. An interactive television system comprising

a input device for allowing a subscriber to select source material to view;

a monitor for displaying the selected source material; and

a profile generator for generating a profile of the subscriber based on source material viewed.

107. The system of claim 106, wherein the profile generator includes:

means for monitoring subscriber activity;

means for retrieving source related information corresponding to the selected source material; and

means for generating a subscriber profile based on the subscriber activity and the source related information.

108. The system of claim 106, wherein the profile generator includes:

means for monitoring subscriber activity;

means for retrieving source related information corresponding to the selected source material;

means for generating a content characteristics vector based on the source related information; and

means for generating a subscriber profile based on the subscriber activity, the content characteristics vector, and a set of heuristic rules.

109. The system of claim 106, wherein the profile generator includes:

means for monitoring subscriber activity;

means for generating a viewing habits profile from the subscriber activity; and

means for generating a subscriber profile based on the viewing habits profile and a set of heuristic rules.

110. A method for monitoring advertisements watched by a subscriber, the method comprising:

monitoring subscriber advertising viewing activities;

retrieving advertising related information including descriptive fields corresponding to an advertisement;

determining the extent to which the advertisement is viewed by the subscriber; and

recording the determination.

111. The method of claim 110, further comprising generating a subscriber profile based on at least one recorded determination.

112. The method of claim 111, wherein the subscriber profile is a subscriber product interests profile.

113. The method of claim 110, wherein said monitoring subscriber advertising includes monitoring volume control commands initiated by the subscriber.

114. The method of claim 110, wherein said monitoring subscriber advertising includes monitoring channel change signals initiated by the subscriber.

115. The method of claim 110, wherein said retrieving advertising related information includes extracting source related text from source material for the advertisement.

116. The method of claim 115, wherein the source related text includes at least one descriptive field.

117. The method of claim 115, wherein the source related text is extracted from an electronic program guide.

118. The method of claim 115, wherein the source related text is extracted from at least one HTML file related to the source material.

119. The method of claim 115, wherein the source related text is extracted from the closed-captioning information.

120. The method of claim 115, wherein the source related text extracted from source material includes a product name field.

121. The method of claim 115, wherein the source related text extracted from source material includes a product brand field.

122. The method of claim 115, further comprising generating at least one advertising characteristic based on the extracted source related text.

123. The method of claim 115, further comprising generating at least one advertising characteristic based on at least one value characterizing the source material

124. The method of claim 122, wherein the at least one advertising characteristic includes an n-dimensional characteristics matrix.

125. A data processing system for monitoring advertisements watched by a subscriber, the data processing system comprising:

means for monitoring subscriber activity including means for storing subscriber selections;

means for retrieving advertisement related information including descriptive fields corresponding to an advertisement;

means for processing information including means for determining the extent to which an advertisement is viewed by the subscriber; and

means for storing the descriptive fields and the determination of the extent to which the advertisement is viewed by the subscriber.

126. The system described in claim 125, wherein the means for monitoring subscriber activity further includes means for monitoring subscriber selection volume levels.

127. The system described in claim 125, further comprising:

means for determining a subscriber product interests profile; and

means for storing the subscriber product interests profile.

128. The system described in claim 125, wherein the means for retrieving advertisement related information includes means for context mining of textual information associated with source material of the advertisement.

129. The system described in claim 128, wherein the textual information is text derived from closed-captioning data.

130. The system described in claim 128, wherein the textual information includes a product name field.

131. The system described in claim 128, wherein the textual information includes a product brand field.

132. A client-server based data processing system for monitoring advertisements watched by a subscriber, the client-server based data processing system comprising:

means for transmitting subscriber channel change requests;

means for monitoring subscriber activity including:

means for receiving subscriber channel change requests;

means for storing the subscriber channel change requests;

means for retrieving advertisement related information, wherein the advertisement related information contains descriptive fields corresponding to an advertisement;

means for determining the extent to which an advertisement is viewed by the subscriber; and

means for storing the descriptive fields and the determination of the extent to which the advertisement is viewed by the subscriber.

133. The system described in claim 132, further comprising:

means for determining a subscriber product interests profile; and

means for storing the subscriber product interests profile.

134. An interactive television system comprising:

an input device for allowing a subscriber to select source material to view;

a monitor for displaying the selected source material; and

an advertisement monitoring device.

135. The system of claim 134, wherein the advertisement monitoring device includes:

means for monitoring subscriber activity including subscriber selections;

means for retrieving advertisement related information corresponding to an advertisement; and

means for determining the extent to which an advertisement is viewed by the subscriber.

136. The system of claim 134, further including a profile generator.

137. The system of claim 136, wherein the profile generator generates a subscriber interest profile based on advertisements that the subscriber views.

138. In a client-server based architecture having a client side and a server side, a method for generating a subscriber profile vector for a subscriber, the method comprising:

monitoring subscriber viewing activities including capturing requests for source material initiated by the client side;

generating subscriber selection data, wherein the subscriber selection data corresponds to a record of requests for the source material;

retrieving source related information, wherein the source related information includes descriptive fields corresponding to the source material;

processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile vector; and

storing the subscriber profile vector.

139. The method of claim 138, wherein said monitoring subscriber viewing activities includes monitoring time durations corresponding to the viewing times of the requested source material.

140. The method of claim 138, wherein said monitoring subscriber viewing activities includes monitoring volume levels corresponding to subscriber selection volume levels.

141. The method of claim 138, wherein the subscriber profile vector includes household demographic data indicating probabilistic measurements of household demographics.

142. The method of claim 138, wherein the subscriber profile vector includes household program preference information indicating probabilistic measurements of household program interests.

143. The method of claim 138, wherein the subscriber profile vector includes household product preference information indicating probabilistic measurements of household product interests.

144. The method of claim 138, wherein said generating subscriber selection data includes context mining of textual information associated with the selected source material.

145. The method of claim 144, wherein the textual information includes text derived from closed-captioning data.

146. The method of claim 138, wherein said retrieving source related information includes retrieving source related information from an electronic program guide associated with the selected source material.

147. The method of claim 138, wherein said generating subscriber selection data includes generating subscriber selection data over a viewing session, and the subscriber profile vector corresponds to the viewing session.

148. The method described in claim 138, wherein said generating subscriber selection data includes generating subscriber selection data over multiple viewing sessions, and the subscriber profile vector corresponds to an average value for the multiple viewing sessions.

149. A data processing system for generating a subscriber profile vector in a client-server based architecture, the data processing system comprising:

means for transmitting a subscriber request for source material;

means for monitoring subscriber activity including

means for receiving the subscriber request for source material;

means for recording the requests for source material as subscriber selection data;

means for retrieving source related information, wherein the source related information includes descriptive fields corresponding to the source material;

means for generating a program characteristics vector based on the source related information;

means for storing a set of heuristic rules;

means for processing the subscriber selection data with respect to the program characteristics vector and the set of heuristic rules to generate the subscriber profile vector; and

means for storing the subscriber profile vector.

150. The system described in claim 149, wherein the means for monitoring subscriber activity further includes means for monitoring time durations, wherein the time durations correspond to viewing times of the requested source material.

151. The system described in claim 149, wherein the means for monitoring subscriber activity further includes means for monitoring volume levels, wherein the volume levels correspond to subscriber selection volume levels.

152. The system described in claim 149, wherein the subscriber profile vector includes household demographic data indicating probabilistic measurements of household demographics.

153. The system described in claim 149, wherein the subscriber profile vector includes a household session interest profile indicating probabilistic measurements of household interests.

154. A data processing system for generating a household demographic characteristics vector in a client-server based architecture, the data processing system comprising:

means for allowing a subscriber to request source material;

means for monitoring subscriber activity including means for storing subscriber selection data, wherein the subscriber selection data corresponds to requested source material;

means for generating household viewing habits information from the subscriber selection data;

means for storing a set of heuristic rules;

means for processing the subscriber selection data with respect to the set of heuristic rules to generate the household demographic characteristics vector; and

means for storing the household demographic characteristics vector.

155. The system described in claim 154, wherein the means for processing the subscriber selection data processes the subscriber selection data over a viewing session, and the

generated household demographic characteristics vector corresponds to the viewing session.

156. The system described in claim 154, wherein the means for processing the subscriber selection data processes the subscriber selection data over a period of multiple viewing sessions, and the generated household demographic characteristics vector corresponds to an average value for the multiple viewing sessions.

157. A data processing system for generating a subscriber profile vector in a client-server based architecture, the data processing system comprising:

means for selecting source material for a subscriber to view;

means for monitoring subscriber activity including

means for receiving the subscriber selections for source material;

means for recording the subscriber selections for source material, wherein a record of the selections constitutes subscriber selection data;

means for retrieving source related information, wherein the source related information includes descriptive fields corresponding to the source material;

means for processing the subscriber selection data with respect to the descriptive fields to generate the subscriber profile vector; and

means for storing the subscriber profile vector.

158. The system described in claim 157, wherein the subscriber profile vector includes household demographic data indicating probabilistic measurements of household demographics.

159. The system described in claim 157, wherein the subscriber profile vector includes household program preference information indicating probabilistic measurements of household program interests.

160. The system described in claim 157, wherein the subscriber profile vector contains household product preference information indicating probabilistic measurements of household product interests.

161. The system described in claim 157, wherein the means for retrieving source related information includes means for context mining of textual information associated with the selected source material.

162. The system described in claim 161, wherein the textual information is text derived from closed-captioning data.

163. The system described in claim 157, wherein the means for retrieving source related information retrieves source related information from an electronic program guide associated with the selected source material.

164. The system described in claim 154, wherein the means for processing the subscriber selection data processes the subscriber selection data over a viewing session, and the generated household demographic characteristics vector corresponds to the viewing session.

165. The system described in claim 154, wherein the means for processing the subscriber selection data processes the subscriber selection data over a period of multiple viewing sessions, and the generated household demographic characteristics vector corresponds to an average value for the multiple viewing sessions.

166. An Internet browsing system comprising:

a input device for allowing a subscriber to select source material to view;

a monitor for displaying the selected source material; and

a profile generator for generating a profile of the subscriber based on source material viewed.

167. The system of claim 166, wherein the profile generator includes:

means for tracking the subscriber selections for source material;

means for the retrieving the source material;

means for generating a content characteristics vector based on the source material; and

means for processing the subscriber selections with respect to the content characteristics vector and a set of heuristic rules to generate a subscriber profile.

168. The system of claim 166, wherein the profile generator includes:

means for monitoring subscriber activity;

means for generating viewing habits information from the subscriber activity; and

means for generating a viewer characteristics profile based on the viewing habits information and a set of heuristic rules.

169. The system of claim 166, wherein the profile generator includes:

means for monitoring subscriber activity including recording subscriber selections for source material;

means for retrieving the source material; and

means for generating a subscriber profile based on the subscriber selections and the source material.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/28528

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :H04N 7/173

US CL :345/327; 348/1,7,9,12,13; 455/2,4.2, 5.1,6.2,6.3

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/327; 348/1,7,9,12,13; 455/2,4.2, 5.1,6.2,6.3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, 5,374,951 A (WELSH) 20 December 1994 figure 7 & columns 14-15.	1
A, P	US 5,977,964 A (WILLIAMS et al.) 02 November 1999 whole document	1-7
A	US 5,786,845 A (TSURIA) 28 July 1998 whole document	8-13
A	US 5,233,423 A (JERNIGAN et al.) 03 August 1993 whole document	8-13
A	US 5,805,974 A (HITE et al.) 08 September 1998 whole document	8-13

[X] Further documents are listed in the continuation of Box C. [] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 16 JUNE 2000	Date of mailing of the international search report 01 AUG 2000
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer CHRISTOPHER GRANT Telephone No. (703) 305-4755

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/28528

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 5,758,259 A (LAWLER) 26 May 1998 figures 5 & 6.	14,15,22 33,34,40 ---------- 30-32, 49-51
X	US 5,635,989 A (ROTHMULLER) 03 June 1997 figure 3	14,22
X	US 5,410,344 A (GRAVES et al.) 25 April 1995 whole doucument, especially figure 4.	14,16-18, 22,23
A,E ---- Y,E	US 6,002,394 A (SCHEIN et al.) 14 December 1999 col. 15, line 58 - col. 16, line 14.	25-29,44-48 ---------- 30-32,49-51
A	US 5,515,098 A (CARLES) 07 May 1996 whole document	30-32,49-51